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FROM THIS ROOM**PC
MAGAZINE**VOLUME 7 NUMBER 4
FEBRUARY 29, 1988**AFTER HOURS: DEDUCT
HASSLES WITH OUR 1987
TAX PACKAGE REVIEWS**

PC Labs Tests 55 Word Processors

Corporate*Personal**Professional**Legal**Desktop
Publishing*

0 1 2 3 4 5

The Most Comprehensive Analysis Ever

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- 9 Real-World Performance Tests





```
record used by Intr and MeDos )  
  
= record  
  case Integer of  
    0: (AX, BX, CX, DX, BP, SI, DI, DS, ES, Flags: W  
    1: (AL, AH, BL, BH, CL, CH, DL, DH: Byte);  
  end;  
  
and untyped-file record )  
  
record  
  Handle: Word;  
  Mode: Word;  
  RecSize: Word;  
  Private: array[1..26] of Byte;  
  UserData: array[1..16] of Byte;  
  Memo: array[1..79] of Char;
```

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Steve (25 iterations)

	Turbo Pascal 4.0	Turbo Pascal 3.0
Size of Executable File	2224 bytes	11682 bytes
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Steve of Erasthenes, run on an 8MHz IBM AT

Since the source file above is too small to indicate a difference in compilation speed we compiled our GOMSVU program from Turbo Gameworks to give you a true sense of how much faster 4.0 really is!

Compilation of GO.PAS (1006 lines)

	Turbo Pascal 4.0	Turbo Pascal 3.0
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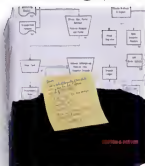
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The National Law Journal
June 29, 1987, Page 14.

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VOLUME 7 NUMBER 4

WHAT'S INSIDE

Contributing editor Frank J. Derfler, Jr., says it often: Never discuss sex, politics, or word processing programs in polite company. Each is sure to inspire passion.

It's been 2 years since *PC Magazine's* last blockbuster evaluation of word processing programs. Since then we've come a long way from the days when we turned to specific programs to do specific things.

Today the best programs are often all-around performers, as capable of performing low-end desktop publishing tasks as they are of formatting long legal briefs.

That's why you won't find programs categorized in this issue the way we categorized them in the past. Instead, you'll see an index in each review that indicates how well the programs are suited for corporate, professional, personal, and legal use, as well as for desktop publishing.

The challenge of separating passion from performance in our evaluation process began in Boulder with frequent contributor Rubin Rabinovitz, a professor of English at the University of Colorado who identified more than 1,000 features of word processing programs. It continued with contributing editor Edward Mendelson, an English professor at Columbia University who grouped those features by category in a 115-page testing script and developed a glossary to define and illustrate them.

PC Labs developed a battery of performance tests designed to identify the truly speedy word processors, while associate editor Carol Ellison gathered 48 profes-



Among the stacks: contributing editor Edward Mendelson and associate editor Carol Ellison led the WP project team.

sional writers and editors to do tests, write the reviews, and make recommendations for Editor's Choice.

The result is the most comprehensive and thorough review of word processing programs you'll find anywhere. It's so big, in fact, that not all of the reviews could fit into a single issue. In this issue you'll find 55 reviews of general-purpose word processing programs. Another 18 reviews of integrated programs will follow in our next issue.

The programs we named as our Editor's Choices were so clearly ahead of the others in features, performance, and price that the jury was never really out.

But feelings did surface once. Editors are not devoid of passion and after the reviews were written, the Editor's Choices chosen, and the magazine was ready to go to press, we shed our objectivity long enough to collect our favorite programs for a photo session. *PC Magazine* photographer Thom O'Connor had a hard time taking the photo you see here, however, because some of the staff members kept moving their own favorites to the top of the stack.

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1 2 3 4

WORD PROCESSING Fast, Flexible, and Forward-looking

Jim Seymour This special issue on word processors takes a look at the most competitive market in PC software. More word processors are available now than ever before, and they offer features that were unheard of when *PC Magazine* conducted its last comprehensive survey of word processing programs 2 years ago. In this issue, the first of a three-part look at word processing programs, a team of 48 reviewers takes a look at 55 packages and their suitability to real-world tasks in the professional, corporate, personal, legal, and desktop publishing environments 92

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Roberto Brosan
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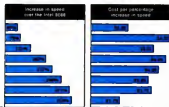
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Breakthru 286-8MHz-\$395

Breakthru 286-12MHz-\$595

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speedup hardware—\$89.95 purchased separately

We are excited about our three speedup products. You probably know about our Lightning disk access speedup software that was awarded PC Magazine's Best of 1986 award (see box). After the smashing success of Lightning, in late '86, we

guaranteed the Breakthru 286 board to be literally the most advanced, fastest, most feature-rich board available. The runaway success it has enjoyed truly proved that assertion. Now we go ourselves one better with the Breakthru 286-12. This new board has the clock speed cranked up from 8 to 12 MHz for speeds up to 10.2 times faster than an IBM PC. It is 50% faster than an 8MHz IBM AT, and up to a whopping 1,000% faster than a regular PC.

HERE'S WHY THESE TWO BOARDS ARE SO SPECIAL.

First, they install so easily. A half-slot card means you don't even have to give up a full slot. What's more, unlike competing

products it works in the Compaq Portable and most clones. Easy diagrams show how you just place the card in an open slot, remove the original processor and connect a single cable. There is no software required. From that moment you are running faster than an AT.

Second, they are advanced. The BREAKTHRU 286 replaces the CPU of the PC or XT with an 80286 microprocessor that is faster than the one found in the AT. Has a 80287 math coprocessor slot for numeric intensive applications. A 16K cache memory provides zero-wait-access to the most recently used code and data. Speed switching software allows you to drop back to a lower speed on the fly for timing sensitive applications.

Third, you have full compatibility. All existing system RAM, hardware, and peripheral cards can be used without software modification. Our boards operate with LAN and mainframe communication products and conform to the Expanded Memory Specification (EMS). Software compatibility is virtually universal.

Faster and smarter than an AT - PCSG guarantees it.

Fourth, these are the best. There are several other boards on the speedup market. We at PCSG have compared them all, but there simply is no comparison. Many cards offer only a marginal speedup in spite of their claims and others are just poorly engineered.

We are really excited about these products. PCSG makes the unabashed statement that the BREAKTHRU 286 card represents more advanced technology than boards by Orchid, Quadram, PC.

Technologies, Phoenix...we could go on. Breakthru 286 is undisputedly the turbo board with the biggest bang for the buck. And we include FREE the \$89.95 acclaimed Lightning software. Call today with your credit card or COD instructions and we will ship your card the very next day.

But, no speedup board cuts disk access time in half

LIGHTNING

software can - \$89.95 or FREE w/Breakthru

"Lightning is almost mandatory...." - Steve Manes, PC Magazine

Best of 86 review

Loads with the DOS - always ready as a background program to accelerate disk access. You do nothing - everything is automatic. Programs that frequently access the disk (hard or floppy) are made instantly up to 2 to 4 times faster. Uses a principle greatly enhanced from mainframe technology called caching. Fully exploits Above Board memory.

LIGHTNING is the standard against which all our competition measures itself because we achieve universal compatibility with other software. Data is never lost. Order LIGHTNING separately or get it free with your Breakthru 286 board.



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DON'T TAKE OUR WORD FOR IT. USE EITHER BREAKTHRU 286 SPEEDUP BOARD FOR 60 DAYS. IF YOU ARE NOT TOTALLY SATISFIED SIMPLY RETURN IT FOR A FULL REFUND.



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Lucid 3-D is priced to sell at \$199, but we want thousands of people using Lucid everyday, all over the world. We invite you to be a part of that group. The reason we are offering Lucid for only \$99, on a sixty day return for a full refund, is simple. Preliminary user testing of the product produces the same results over and over. People tell us they would never work without Lucid 3-D again. Even folks continuing to work with 1-2-3.

Memory Resident

That's because the idea of a memory resident spreadsheet makes sense, one that you can pop-up instantly while working in your word

way we dreamed a spreadsheet would function. Everyone who has seen it says things like, "Lucid 3-D is how software of the 1990's will look and perform", or even more to the point "This is the way I thought a computer should work". You'll see, Lucid is exciting.



FIG. 2 Here we are. Instantly. Notice the lower left corner showing we are on level 2. You can go down or up. (See next page)

processor or any other program. Lucid lets you cut anything on the screen and paste it into Lucid, or cut anything from a Lucid worksheet and paste into the application below. You can even run Lucid on top of 1-2-3 if you like, and cut and paste information from one to the other, including formulas.

Lucid 3-D was developed over the past two years with countless, exhaustive hours of planning and programming to produce something spectacular. This is a product that works the

multi-dimensional. Any cell of the spreadsheet can contain a complete other spreadsheet that you can access with a single keystroke. It is as simple as the pictures show. And you don't have to write formulas to do that. All you do is go look at the other file, navigating through easy, point and shoot directories. When you come back up (with one key) the link is made automatically for you.

Everything about Lucid works that

way. Users say "It is so intuitive that I really don't need a manual." That's because we use something we call a visual command menu. Jim Seymour, the noted PC columnist, talking about Lucid in a recent article said that, "If there ever was an interface idea so good it ought to be stolen and widely used, this is it."

What he was talking about is a new menu approach that follows a simple design concept: it is easier to recog-

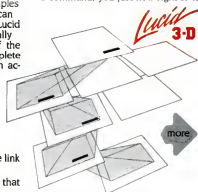


FIG. 1 Let's get the detail on those ad costs. Just move the widebar to that cell and press one key (grey +).

What Makes It so Special

In the screen examples you can see Lucid is really

nize than it is to remember. As choices are made on a menu that take you to lower levels you always can see exactly where you came from and where you are going. The complete menu path is always visible. You cannot get lost several levels down. This means you never have to remember a command, you just flow right to it.



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Any cell can contain a complete other spreadsheet that you can access with a single key.

Plus, no matter where you are on a menu or what you are doing, just press function key F1, and you will get a help screen specific to that command or action. Or if you want to know about any subject you can pop up an index of over 400 topics and select the one you want.

Notepad Behind Every Cell

Another 3-D feature is that any cell can also contain a multiple page note that you instantly access with a single keystroke. You can write



FIG. 4. Now, instantly we are on level 3. Each level is a different spreadsheet. You could now move to the New York Times and see the detail on that figure. There is no limit to the levels you can go. Move right down to transaction level if you like.

notes, memos or letters that relate to your work, save them as individual files and even print them separately or with your spreadsheet.

Speed

Lucid 3-D is truly revolutionary. It is fast, fast, fast! It is incredibly quick in performing calculations because it doesn't recalculate every cell every time you insert an entry. Instead, it only recalculates the specific cells that are affected by your change. This is called minimal recalc. Lucid also has a remarkable innovation called background recalc in which you are given control of the cursor the moment calculations affecting your viewing screen are completed. Other calculations you don't see continue on in the background during the next commands. The end result of this powerful combination is you rarely wait for a recalculation with Lucid. You find out what instantaneous is all about.

Lucid Learns

Lucid 3-D also lets you teach it any

combinations of keystrokes so that involved sequences can be

done with single keys. Plus more than just remembering keystrokes, Lucid allows you to create Macros with loops, procedures and conditional branching amazingly all done automatically with simple menus. You can create your own menus that show the new features you have taught it. Another great feature is you can make your custom menus work like Lucid where one choice can take you down a level to a whole new set of choices. What's nice is that they will work from one spreadsheet to another.



FIG. 3 We want more detail, so let's go to Newspapers, just press the Grey + Key

“The best idea I’ve seen for a spreadsheet in years.”

Jim Seymour, Columnist, PC Magazine, PC Week



Fig. 5. Of course, Lucid does multiple windows. Notice, you can simultaneously open windows in different directories, different drives, even down as many as 3-D levels as you like. No one else can do that.

Mouseability

Lucid 3-D was designed for both keyboard enthusiasts and mouse lovers alike. You can take your pick. Designed around the mouse from the ground up, the interface is smooth and natural. You select files to load from directory lists. Everything is point and click. What's more, any Lucid 3-D menu selection can be "moused" and the response time is "right now" instead of the sluggish "a little bit behind you" feel of add-on mouse menu systems like those you've seen with 1-2-3.

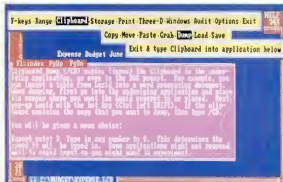


FIG. 6 We need those budget figures in the Word Perfect letter we are writing. Clipboard Dump does it right now.

A window pops up with a library of function names you can page through with the mouse. Select, click and it's in the formula with no typing required. You even have a label window that you can fill (from the keyboard) with favorite labels and names so that you can insert them later with the mouse. There's even a pop-up calculator to insert numbers so you don't have to go to the keyboard very often.

It really permits that feeling of becoming one with your work. Lucid 3-D has windows of user defined range names as well as the macros named by the user that can be selected just by pointing and clicking. Icons that are easy to grab with the mouse let you resize and move the spreadsheet window with the ease you would expect. Plus you can go anywhere on the sheet by moving the mouse and clicking on the spreadsheet borders. And remember Lucid is designed so that any of those features are done with or without the mouse easily and quickly.

Audit

When you are staking a big decision on information gained from a spreadsheet you need to be certain that you have made no mistakes. Lucid offers five audit displays and printouts.

Masterwork

We could go on at great length about all the features and innovations in Lucid, but Lucid is more than a bag of features. What is most important is the pride and craftsmanship that went into its creation. It is a master-



Makers of **LIGHTNING™**
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FIG. 7 Here it is right in Word Perfect (or any word processor) just like you typed it. You can go the other way just as easily.

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James Johnson

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work. The overall feel is tight and polished. In fact, Paul Somerson, executive editor of PC Magazine, used one word to describe it, "Slack".

PCSG has built a reputation as a development laboratory producing products that you know are excellent. In 1983 PCSG dominated the Model 100 laptop market with ROM based software that every reviewer rated as excellent. In 1985 we produced **LIGHTNING** the pioneer and award winning Disk speed up software. In 1986 we developed the **BREAKTHRU 286** accelerator board that blew everything else out of the water, and later we topped ourselves with the Breakthru 12. Now in 1987 those who have worked with Lucid 3-D tell us "you have done it again. This is software everyone should have."

Even if you don't plan to abandon 1-2-3, Lucid makes sense. Files are converted between them with ease so there's not an interoffice compatibility problem. This means you can have the power and fun of Lucid 3-D without having to upset your present systems.

We are excited about Lucid 3-D. But don't take our word for it, take us up on our 60 day offer. Call us on our order line number and we will ship your order the very next day. This \$99 offer won't last because we will be shipping to the dealers soon. But in the mean time we invite you to try Lucid as part of our "spread the news" campaign. Just pick up the phone and call us. We accept all major credit cards or you can order COD.

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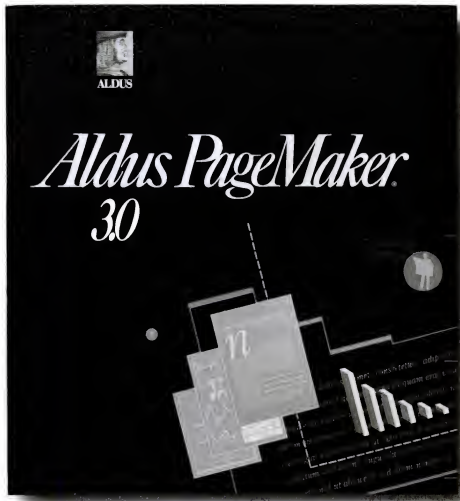
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LETTERS TO PC MAGAZINE



APPLES AND PS/2s

Let me express my thanks and respect for *PC Magazine's* comparison of the IBM PS/2 and the Apple computer ("Mac the Knife: Apple Cuts In on IBM," *PC Magazine*, November 24, 1987). You have



taken a very large step in bringing the computing community closer together by expounding upon how much we are alike, rather than focusing on those few things that make us different. Bravo!

Al Westerman
Cincinnati, Ohio

Your comparison of the Mac II and the PS/2 Model 80 was very fair ("Mac the Knife: Apple Cuts In on IBM"). However, I can tell you that I wouldn't part with my Mac II for the fastest DOS system on earth. If you ask me, the Mac II is the ideal system. (And just for the record, I'd like to point out that the Mac II uses an SCSI hard disk, not an ESDI as was stated.)

David S. Broudy
Rancho Santa Margarita, California

I picked up my first issue of *PC Magazine* at the newsstand when I saw my favorite computer on the cover—the Mac II ("Mac the Knife: Apple Cuts In on IBM"). Although I had expected to find biased articles extolling the virtues of the PS/2 Model 80, instead I found an intelligent and even-

handed discussion of the two machines. Congratulations to John C. Dvorak, Jim Seymour, and the editors of *PC Magazine* for a factual comparison.

With the introduction of the Mac II and the PS/2 Model 80, the gaps between the IBM and Macintosh factions are not as gaping as they were 2 years ago. Apple has produced a machine that delivers the power and expandability that is needed by power users, and IBM has discovered that pointing devices and graphic user interfaces can produce a more effective and productive user. As the gaps close, we will all have to subdue our arrogance and define our allegiance to either camp simply as personal preference.

Bill Dyches
Atlanta, Georgia

Thank you for your fine articles on the Mac II and PS/2 Model 80 ("Mac the Knife: Apple Cuts In on IBM") and for William G. Wong's sidebar "Sticking Up the Chips" on page 130. It is true that as a nonprogramming user I do not need to know how a particular chip operates. However, I greatly appreciated Mr. Wong's insights and clear explanations. Such clarity of language helps me make a more informed choice, even if I do not fully understand chip technology.

Richard L. Harnack
Webster Groves, Missouri

I would like to make several points based on your articles on IBM versus Apple ("Mac the Knife: Apple Cuts In on IBM").

First of all, computers have only one purpose, and that is to be utilitarian-task completers. Although some people develop very intense emotional bonds with their

machines, we cannot forget that computers are here to do a job. In this regard, anyone who is convinced that the Mac II can really do all jobs better than the IBM PS/2 Model 80 (or vice versa) is fooling himself.

Second, the differences between the two standards are beginning to fade. The Mac II has separated itself from its Apple predecessors by becoming more similar to the IBM. Similarly, IBM's new lineup of PS/2s resembles "Applied" XT's and AT's. The reason for this merging of standards is that all users, whether they are using an Apple, an IBM, or a Googleportz, have similar needs and desires that the computer companies are recognizing.

Finally, let's keep things in perspective. The computing industry is in its infancy. Both machines and both standards are the Model-T Fords of our industry. My bet is that in 10 years we'll look back at both standards and chuckle. Maybe some firms will still have a Mac II or PS/2 in their offices. After all, there are still a few horse-drawn carriages in Central Park.

Justin Page
New York, New York

PUT IT IN ITS PLACE

In your November 10, 1987, issue, the cover story, "Lasers: A New Standard," states "although none are represented



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- ☐ **MUSIC 2a,b**—(2 disks) PianoMan 3.0 polyphonic music recording and playback program.
- ☐ **ORGANIZER 1**—DeskTeam, a Sederick clone, and the Jody personal calendar program.
- ☐ **PRINTER 1**—Resident print control and font utility, intelligent spooler, banner maker, and more.
- ☐ **SIMULATION 1**—Maze making program, MIT's Life simulation, sharks, etc. Color graphics req.
- ☐ **UTILITIES 1**—A collection of available general purpose DOS utilities. An absolute must for all.
- ☐ **UTILITIES 2**—More available DOS utilities including screen burnout, ram disk, and more.
- ☐ **UTILITIES 3**—A comprehensive set of debugging and diagnostic utilities for monitoring your computer.

NEW RELEASES UPDATES

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- ☐ **CAD 1a,b**—(2 disks) Fingerprint 1.2 advanced pattern and Altamira object oriented design. Color.
- ☐ **CAD 2a,b**—(2 disks) DanCad3d, an advanced 3D modeling program environment. \$426, color.
- ☐ **COMM 2a,b**—(2 disks) Procomm 2.42, an excellent modem program with terminal emulation.
- ☐ **EDUCATION 3**—PC-Fastype 1.20 typing tutor, ideal for beginners and advanced students alike.
- ☐ **FINANCES 3a,b**—(2 disks) Express Calc 3.12, a powerful and user friendly spreadsheet program.
- ☐ **GAMES 8**—Strike helicopter attack and Risk, the game of world domination. Color required.
- ☐ **GAMES 12**—Backgammon (play the computer) and Wheel of Fortune based on the game show.
- ☐ **GRAPHICS 1**—Record and play back screen images! Excellent for demo, etc. Color required.
- ☐ **GRAPHICS 2a,b,c**—(3 disks) An excellent 3-D surface modeling and shading program. Color.
- ☐ **INFO 2a,b**—(2 disks) Zip Phone, national area code prefix to zip-code cross reference.
- ☐ **LANGUAGE 3a,b**—(2 disks) The ABE 3.09 menu assembler and debugger for IBM PC/XT/286.
- ☐ **SHELL 4a,b**—(2 disks) Automenu and HDM II 4.4 hard disk prog. for custom full-screen menus.
- ☐ **UTILITIES 5**—Hard disk utilities for verifying, formatting, partitioning and optimizing your disk drives.
- ☐ **UTILITIES 6**—Advanced utilities including Mark/Release (remove resident programs w/ reboot).
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VIEWPOINTS

LETTERS

here, some manufacturers have used arrays of light-emitting diodes (LEDs) to create a printed image." NEC Silentwriters, which are covered in this article, are LED-array page printers. In fact, the table "Product Support for Page Description Languages," in your article "Putting Text and Graphics in Their Place" (*PC Magazine*, February 10, 1987), correctly put the NEC Silentwriter LED-890 under the category of ink-jet/LED-array printers. NEC's Silentwriter certainly deserves

it states that you can exit the program and return to DOS by pressing Ctrl-Q. You do not have to reboot your computer, as was stated in Ms. Miller's otherwise excellent review of the game.

Bob McLean
Naperville, Illinois

WELCOME ADVICE

Thanks for the suggestion mentioned in the Spreadsheet Clinic letter entitled "Remember to Exit" (*PC Magazine*, November 10, 1987). I tried it, liked it, and put it on all my computers that have 1-2-3 on their fixed disks.

J. Thompson
New York, New York

Ray Duncan is a rare bird: a technical maven who can write for a broad audience.

your Editor's Choice. Because more than one pixel can be turned on or off, the speed potential of this printer is great. Of course, the challenge is that complicated logic circuits have to control hundreds of LEDs simultaneously. But unless a better method comes out, I believe printers using LED-array technology will eventually replace the ordinary laser printers.

Yuan Jiang
New York, New York

A RARE BIRD

It is wonderful to see that Ray Duncan will be a regular *PC Magazine* columnist. I have followed his writing for many years and have always enjoyed the clarity and vigor of his writing. He is a rare bird: a technical maven who can write for a broad audience. Congratulations to *PC Magazine* and best wishes to Mr. Duncan. You will make many readers happy.

Michael Ham
Santa Cruz, California

CARMEN'S GRAND EXIT

I recently purchased *Where in the USA Is Carmen Sandiego?* and, like Catherine D. Miller, I have found it to be both entertaining and educational (After Hours, *PC Magazine*, November 10, 1987). I want to point out that in the operating instructions

As I continue to read *PC Magazine*, may I never again think I don't need your help.

printer off an IBM PC AT. Sending a control code from BASIC to LPT2 is beyond me, so the problem of extra line feeds came back. But then I remembered the article. As I continue to read *PC Magazine*, may I never again think I don't need your help.

Michael Lee Bain
East Point, Georgia

I recently bought an EGA and a MultiSync monitor and found my back issues of *PC Magazine* to be very helpful when I had to decide which of the many available prod-

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Right down to the user interface which, according to the *InfoWorld* Review Board makes the Advanced Edition "as easy to use as possible."

And that's not all.

The more the merrier. Because the Advanced Edition goes on to include a wish list

of brand new technical features and functions.

Like *Speed Disk*, for tightening up disk space and optimizing access.

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All of which explains why *InfoWorld* called the Advanced Edition "a great program that has gotten even better."

We just call it good company.

Peter Norton
COMPUTING

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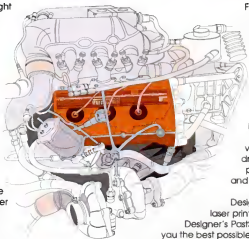
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With Designer, you can load a scanned image you have sketched. Then trace over the bitmap to create a resolution-independent image which you can stretch, color, and enhance with far more detail. But Designer doesn't stop there. It includes unmatched drawing tools, such as spline and parabolic curves, freehand drawing, lines and polylines, arcs, and ellipses.

Designer allows you to edit polygons and curves, fill irregularly shaped objects, and rotate text and graphics to one-tenth of a degree. Designer's variable zoom, fully associative dimensioning, 64 layers, 5 line styles, and 15 arrow and end styles provide unlimited control over your drawings.

Designer provides extensive text handling capabilities such as merging text files from popular word processing programs and supporting graphic and bitmapped fonts. You can edit text and even stretch and rotate it. And Designer supports all Windows-compatible fonts and downloadable fonts.



For engineers, Designer includes a symbol library management system for assigning part numbers, annotating drawing files with descriptive names, and generating parts lists. It also comes with Windows CONVERT, for transferring files to AutoCAD and back.

For graphic artists, Designer includes tools for mixing millions of colors (RGB, CMY, or HLS), viewing and layout aids, a large drawing area (160" x 160"), compatibility with Aldus PageMaker, and thousands of ClipArt images.

Designer supports the most popular laser printers, plotters, and color printers. Designer's PostScript compatibility guarantees you the best possible quality output from 300 DPI on your laser printer to 2540 DPI on an Allied Intertonic 300 phototypesetter.

In addition, Designer is compatible with Micrografx Windows GRAPH, Windows DRAW, and In'a'Vision, plus Microsoft Excel and Windows Write. And Designer's interface is based on Windows 2.0, matching the user interface of IBM's Presentation Manager for OS/2.

For additional information, call your local Micrografx Authorized Dealer or call toll-free 1-800-272-DRAW (in Texas, 214-234-1769), or write to Micrografx, Inc., 1820 North Greenville Ave., Richardson, Texas 75081.

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■ LETTERS

ucts to buy. In addition, when I wanted to write Turbo Pascal programs to use the EGA, another back issue gave me the information I needed to do this using Turbo Pascal, Version 3.0. In short, keep up the good work. I've read many other computer magazines and have yet to find one that compares to *PC Magazine*.

John Emmerson
West Lafayette, Indiana

QUICKBASIC CLEANUP

It has been a long time since I have done business with a company as arrogant as Microsoft. Indeed, to release Version 4.0 of QuickBASIC and to charge current owners for that release is a travesty (First Looks, page 33, *PC Magazine*, December 8, 1987). It should be cleaning up the multitude of errors, republishing the "documentation" to eliminate the errors it con-

■ There are a lot of us out here who don't care if Vanna White is shaped like a pie chart.

tains and clear up the confusion it creates, and doing a housecleaning on the "support staff." However, Microsoft has my money, and it very craftily created a compiler that won't work with files used by other compilers, so I guess it will get some more of my money.

Carl Metler
Tyler, Texas

ANOTHER CURVE

In his article "The Upgrade Road: Curves Ahead!" (*PC Magazine*, November 10, 1987), Stephen Manes states, "The next serious upgrade [for my PC-1] began with the new ROM BIOS chip that could see 640K RAM and let DOS boot from my brand-new Kameron outboard hard disk."

I too have an IBM PC-1 and am interested in being able to use a hard disk. However, when I asked about upgrading my ROM BIOS at my local ComputerLand

store, they told me it could not be done. Please let me know how and where I can upgrade my ROM BIOS chip—I am sure I am not alone in this situation, so your answer should help many readers.

John C. Erb
Biloxi, Mississippi

IBM recently withdrew the ROM BIOS upgrade chip from its catalog. The result: the only way you can upgrade your motherboard is to swap it for a new one.—Ed.

OUT OF CONTROL

It doesn't say much for your credibility as technological experts when the males at *PC Magazine* persist in burying their heads in the sand instead of accepting the sexlessness of intelligence. I am referring, of course, to your Utilities column "Getting Control of Your Cursor" (*PC Magazine*, November 10, 1987). There are a lot of us out here who would like to gain control of our cursor but don't care if Vanna White is shaped like a pie chart. Come on, you guys, get with it.

Sarah J. Whitener
Houston, Texas

CORRECTIONS/AMPLIFICATIONS

The correct phone number for Clear Software (Inside Track, *PC Magazine*, December 22, 1987) is (617) 232-9788.

Both the *Ventura Publisher* version and the *Microsoft Windows* version of Bitstream's *Fontware Installation Kit* allow users to create fonts for PostScript printers (First Looks, page 43, *PC Magazine*, December 8, 1987).

HOW TO WRITE TO PC MAGAZINE

Do you have a comment, compliment, or criticism about something you've read in *PC Magazine*? A question you'd like to open up to other readers? Then send your opinion to Letters to *PC Magazine*, One Park Avenue, New York, NY 10016, or through MCI Mail to PCMAGAZINE.

All letters become the property of *PC Magazine* and are subject to editing. We cannot publish letters that do not include a name, address, and phone number for verification. We're sorry we're not able to answer letters personally.

The Public (Software) Library, the largest and best collection of up-to-date, well-organized public domain and shareware software received the following unsolicited letter recently:

"This Is A Fan Letter!"

writes the executive director of a state college commission.

"From time to time I have hit on some ads and requested catalogs from [Public Software Library], and others. I also have ordered some disks, but I have never been satisfied."

"Then I read your ad in *PC Magazine* and thought: 'Well, it won't hurt to try one more time. Maybe this guy is doing it right.'"

"When I received the catalog and information, I decided to try an order since the system seemed to be so well organized."

"WOW! It was more than I expected."

"I read through the past newsletters on disks for 1985, 1986 and 1987 in two sittings. It was so payable. I learned a great deal and it whetted my appetite to try more."

"I am also impressed with the shareware concept. I get a chance to try the programs with minimal investment and if the program doesn't suit my system, needs, or taste, there is no big loss as there would be with a commercial program."

"So thanks for an excellent system. It is well organized and something that an average user can figure out and actually use."

Note: Some programs require no further payment; others are shareware for which payment to the program's author, usually in the range of \$10 to \$50, is required to register a program for continued use.

Find out for yourself about what most experts (and average users too, evidently) know is the best library of PD/shareware software available for you to use or try out, all for one low disk fee.

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PC BRAND ANSWERS THE MOST ASKED QUESTIONS ABOUT THE NEW CLIPPER™—SUMMER '87

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What Does The Clipper Compiler Do?

Clipper™ compiles dBase III™ and dBase III Plus™ source code programs, procedure and format files into a binary program which can be distributed and executed independent of dBASE.

How Much Faster Is Clipper?

Applications run up to 20 times faster than the same application in dBase III or dBase III Plus. The average application typically runs 5 or 10 times faster.

How Compatible Is Clipper With dBase III and dBase III Plus?

Clipper supports the majority of dBase III commands except those that are normally used interactively. There are some minor differences in the implementation of some other commands.

DBF, FRM, MEM and LBL files are the same as interpretive dBase III. Clipper index files have the extension .NTX (corresponding to dBase .NDX) and result in faster indexing and more efficient use of disk space.

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- compatible with Microsoft C
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- 255 open files utilizing DOS 3.3
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- enhanced debugger
- powerful menuing command
- interactive command simulation (BROWSE)

Does Clipper Support Networking?

Yes. Both versions Autumn '86 and Summer '87 allow you to run compiled applications on most popular networks. They feature record and file locking and support Expanded Memory.

A second work station may view or read a locked record or file and produce reports. However, an operator of the second station cannot update or write to a locked record or file.

Do I Need Any Kind of Runtime Module To Run A Clipper Compiled Program?

No. Clipper produces an object code module with the extension .OBJ. When the .OBJ file is linked (using PLINK86 which is included) a relocatable file with the extension .EXE is produced which can be run directly from DOS.

Do I Need Clipper For Every Program I Distribute?

No. You can compile and distribute as many programs as many times as you wish. Nantucket charges no runtime or

royalty fees for distribution of your compiled applications.

Are There Royalties For Adding Work Stations?

No. Clipper places no limits on workstations. You may add as many workstations as your networking software will allow with no additional fees.

Does Clipper Handle Memo Fields?

Yes. Memo fields can be stored as string values, allowing them to be searched, concatenated and REPLACED. ASCII text files can be read into memofields and memofields can be read into ASCII text files.

What Size Are Clipper Compiled .EXE Files?

The minimum size Clipper file is about 145K. This overhead is a one time expense and is present in even the smallest program. DOS requires 30-40K of memory. In addition, Clipper requires 64K for its own purposes once loaded, which means that in a 256K machine you could load a program of about 160K into RAM. If you create a program that exceeds your computer's memory, you may create overlays to work around the problem.

What Are Overlays?

Overlays are portions of your application that will NOT reside in your computer's memory until executed. An area of memory is designated for overlays by the linker. You then specify which portions of your program are transferred in and out of that memory area.

In What Language Is Clipper Written?

Clipper is written in the Microsoft C (5.0) language with some assembly language routines.

Does Clipper Allow You To Create Windows?

Yes. With Clipper's new SAVE SCREEN

REAL PROGRAMMERS DON'T USE dBASE. OR DO THEY?

We're finding that some very swift programmers are using dBASE™ to write some very fast applications, and are completing their projects much more quickly. But they cheat.

They use the Clipper™ compiler to combine dBASE with C and assembler. With dBASE used like pseudo-code, they can then quickly create prototypes that actually run.

Then, with dBASE doing the high-level database functions, they use the Clipper compiler to link in C or assembly language modules from their own bag of tricks.

And they're finding that they're linking in less than they expected because Clipper compiled code runs so fast and because of Clipper's built-in enhancements. Clipper includes:

- Easy networking that provides file and record locking the way it should be done
- Fast screens that can be treated as memory variables and eliminate the need for direct screen writes and all that tedious housekeeping code.
- Box commands that make windowing a breeze. And more.

So if you'd like to use your time more productively, choose Clipper out

and RESTORE SCREEN commands windows can be created and manipulated.

Will Clipper Interface With Microsoft Windows™?

Clipper will run and compile with Microsoft Windows™ but will not run as a separate task.

Is Clipper Limited To 640K Of RAM?

No. Clipper employs the Lotus/Intel/Microsoft™ expanded memory protocol, allowing use of up to 1 megabyte of RAM.

What Hardware Is Required To Run Clipper?

Clipper runs on any IBM PC, XT, AT, 3270 or 100% compatible machine running DOS 2.0 or greater for single user applications. Networking applications run on most major networks supporting DOS 3.1 or higher.

Is Clipper Copy Protected?

No. Copy protection was removed with the release of the Autumn '86 version.

Call for price details today



dBase III and dBase III Plus are trademarks of Ashton Tate. Clipper is a trademark of Nantucket Corporation. PLINK86 is a trademark of Phoenix Software. Microsoft Windows is a trademark of Microsoft.

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Clipper™ turns lumbering dBASE® into a speed demon with benefits building in as well as your source code is subprogrammed from public view, you can distribute your compiled application without royalties, and your customers don't even need copies of dBASE. The Spring '87 Clipper offers index files compatible with dBASE III Plus, and networking capabilities to run compiled programs on major networks supporting DOS 3.1 with no restrictions on number of users. Clipper offers arrays, menu-building commands,

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What for? It means both C and dBASE applications can operate on the same data bases interchangeably. It means C programmers can interface with the big market of dBASE users out there, yet side-step the dBASE language. It means dBASE applications can now be linked to the features of C libraries and objects to add windows, graphics, statistical analysis, all the things dBASE cannot do. It means the speed and power of C to improve clients accustomed to dBASE's dBC's functions parallel all dBASE's file handling commands, many decomposed

to permit direct data manipulation. Ten, each of data, index, and memo files may be open at once. It also complete an ISAM package that you can forget dBASE and use dBC only for C programming.

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WALLSOFT'S THE UI PROGRAMMER

Code generator for dBASE

The UI Programmer was developed for professional dBASE programmers who have been frustrated in the past by code generators. Up until now, a serious dBASE programmer had to take whatever code a generator produced and modify it to their needs. With UI, the developer can generate exactly the dBASE code wanted.

UI (User Interface) has two main functions: the first is a powerful forms editor to create sophisticated screens and menu forms in a matter of minutes. The editor is completely menu-driven. It works on the point-and-shoot principle—just put the cursor where you want and tell UI what to put there.

UI's other, more important, main function is generating code for the forms

you've designed. Once you have the form the way you want it, you can call up the "Generate" menu, and tell UI which item in the menu you want to generate the code with. That's the key—each template tells UI to produce a different kind of dBASE program.

It's through these templates that you can program the way UI generates source code. You can use the templates that come with UI "as is" (there are about 25 of them), completely rewrite them, or write your own. So you don't lose control of design, like you do with other generators. You just let UI do the tedious work.

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UI DOCUMENTOR	\$295	\$244
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dBASE AT THE SPEED OF C

dBx Translates dBASE Applications to C

You dBASE™ programmers know what an expressive and readable language dBASE is. It's a very comfortable development environment. But the price is debased performance. Even compiled dBASE doesn't offer the speed that some users require these days. The kind of speed offered by software written in the C language. The answer is dBx™.

dBx translates dBASE to C. It offers you a major competitive advantage over the rest of dBASE programmers. Keep writing in dBASE. Take every application all the way to completion. Then use dBx to translate them top to bottom to C.

Other advantages: C is portable, even to other operating systems like UNIX/Xenix™. To the Macintosh or Amiga. dBx gives your applications a passport to places dBASE cannot go.

Has its own file manager for single user, but unlike most C file managers—no tree and dBC—for compatibility with dBASE files or multi-user support. We have everything you'll need, including good advice. Last PC Brand dBC with Library Source with Full Source Code \$350 \$250 \$550 \$460 \$1900 \$1282



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If you are one of the millions of personal computer users who are frustrated by slow disk access, you need OVERDRIVE. Overdrive will make your disk-limited programs such as databases run faster. How fast? It depends upon your particular circumstances, but 50% speed increases are not uncommon.

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drive will run even faster on your RAM disk because Overdrive eliminates the DOS "hunking time," the disk time Overdrive hooks itself into DOS and replaces its old slow program code with modern, efficient, well-designed routines.

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■ MITT JONES

PC ADVISOR



Help in converting Wang files to and from PC formats, in using the PC to develop product names, and in installing an EGA in an AT&T 6300.

AT&TEGA

Is there any way to add an EGA card to an AT&T 6300? The standard video controller AT&T furnishes gives 640 by 400 resolution but with only two colors. I've considered buying AT&T's Display Enhancement Board to give me 16 colors at the high resolution, but only a few software packages support that board.

Robert McClain
Kingsport, Tennessee

You can add on EGA to the 6300 with a small investment of time and money.

First, if your system uses a BIOS prior to Version 1.43, which added EGA support as well as a few other goodies, you'll have to order a new BIOS (\$35; part no. 105203780) from the AT&T Parts Center (tel.: (800) 222-7278). Your system should show the BIOS revision number during the resident diagnostics at boot-up.

Next, you must disable the 6300's indigenous controller. You can't just yank it out, however: the 6300 actually routes power and signals to the bus through the video controller.

One version of the controller can be disabled by changing a jumper setting. Another version can be disabled by replacing a chip on the controller. Either way, the controller stays in the system to pass along the signals to the bus.

Still another version of the controller must be removed and replaced with the Video Bridge Adapter (\$59; part no. 405067281), also available from the AT&T Parts Center. The Bridge Adapter is simply a board with circuit tracings that

passes along the necessary power and signals to the bus.

To determine which controller your system has and which parts you'll need, your best bet is to call the AT&T technical support hot line. The toll-free number is (800) 922-0354. But take the cover off your system before you call: you'll have to read a number or two from the system's innards to help the technician identify your specific controller.

You'll also have to buy a new monitor if you plan to install on EGA. The AT&T monitors don't scan at the correct rates for EGA modes. Your smartest buy would be a multiscanning monitor, but an EGA monitor would, of course, do fine. Turn to PC Magazine's March 31, 1987, issue for our evaluation of EGA and multiscanning monitors.

Now that you know what steps you'll need to take, you should also know that AT&T does not recommend installing an

EGA card in the 6300. The 16-bit bus of the 6300 was originally designed for the Z8000 processor. As a result, you won't be able to use software that writes to the EGA in full words through the I/O ports. Though seldom used, this method of manipulating the EGA offers a speed advantage over half-word (one-byte) I/O port writes.

WANG-PC CONVERSION

Our company uses a Wang OIS system with a 5¼-inch floppy disk drive. We recently purchased a PC compatible and have been paying a disk conversion service \$35 a disk to convert our Wang files to Microsoft Word files to run on the PC. Surely there is a less expensive alternative.

Margaret Vogel
Paterson, New Jersey

There are several routes you could take, but probably the most straightforward and cost-effective solution comes in the form of a software package from General Information Systems (Philadelphia, Pa.; (800) 872-4478). The \$375 package, Archive-Link, runs on PCs and compatibles with plain old 5¼-inch floppy disk drives and translates 5¼-inch Wang VS, OIS, and Alliance files into any of several PC word-processor formats. The translations also work in the reverse order—from the PC word processors to the Wang systems.

In addition to Microsoft Word, Archive-Link translates files to and from ASCII, DisplayWrite, MultiMate, OfficeWriter, WordPerfect, and WordStar formats. Installing and learning the menu-

■ You'll have to buy a new monitor if you plan to install an EGA. The AT&T monitors don't scan at the correct rates for EGA modes.

■ PC ADVISOR

driven package will take all of about an hour, and the translations are impressive.

General Information Systems also markets a \$375 Wang terminal emulation package, VsCom, that can make the same file conversions through an asynchronous hookup or through hard-wired connections such as local area networks.

WHAT'S IN A NAME

Advertising agencies are often called upon to help develop names for new products. Can you tell me if there are any software programs available for this task?

Sutton Marks
Jackson, Mississippi

We first reviewed Namer in PC Magazine's October 28, 1986, issue, and we liked it then. Now Salinon Corp. (Dallas, Tex.); (214) 692-9091 has lowered the price to \$99 and included all its names databases at no extra charge.

Namer can give your creative juices a boost in several ways. The Original Name Generator, for example, outputs three- to eight-letter names that, if nothing else, tend to be original. As the names scroll across the screen, you can save the ones you like for later review. A few of my favorites were avod, raver, and neclust.

Of the other ten naming tools, the Connotation Synthesizer and the Phrase Maker are probably most often used. The Connotation Synthesizer lets you choose from a menu of descriptors—the qualities you want the product name to connote—and builds appropriate names from word parts or from the Latin and Greek roots of the English language. For instance, choosing High Tech and Analytical-Knowledgeable from the descriptor menu might give you inticelon as one of many suggested names. The Phrase Maker suggests names and slogans by piecing together synonyms for words you choose.

In addition to the naming tools, Namer includes databases of names you can peruse. For instance, the company names database lists names already in use to help you avoid duplication.

Once you've decided on a name, you don't want to risk the all-too-likely possibility that your name translates into some sort of profanity in a foreign language. To avert such a disaster, Namer includes a profanity checker that checks your name against hundreds of profane and vulgar words in English, Spanish, Italian, German, and French.

Last but not least, Namer even includes extensive databases of girls' and boys' names for those planning a more personal sort of product.

ASK THE ADVISOR

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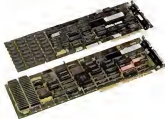
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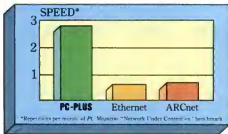
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FIRST LOOKS

Model 80 at 20 MHz: As Fast as a Deskpro 386/20?



HANDS ON

BY JOHN DICKINSON

Wow—it seems as if IBM'll do just about anything to get you to buy one of its PS/2 personal computers. It's even built a decently fast one. Unfortunately, it's not indecently fast.

It took a while, but we finally got our hands on a PS/2 Model 80-111—that's the one with the 20-MHz 80386 microprocessor, 2MB of fast RAM, and a just-right-for-power-users 115MB hard disk, which IBM scheduled for fourth-quarter 1987 delivery back in April when it introduced the PS/2 line. Inevitably, the new Model



An impressive package: with the oversized PS/2 display, the Model 8514, IBM's PS/2 flagship, delivers a lot of performance, but at top dollar.

80 has to be compared with Compaq's new Deskpro 386/20, and inevitably, or so it seems, the PS/2 comes up short.

Don't get me wrong. The

new Model 80 is a nice computer that's easily fast enough for single users and probably fast enough to use as a server on most local area networks. But it

seems strange to me that the biggest computer company on earth spent all those engineering dollars on its new Micro Channel Architecture only to get beat out—and not by a little—by the upstarts from Texas using a supposedly outdated PC-compatible bus design.

PC Labs processor benchmark tests yield a tie between the big PS/2 and the fastest Deskpro when they're running the NOP test, but that's not much of a surprise since that test just measures clock speed. The surprise is that the Compaq does the 80386 instruction mix a solid 10 percent faster than IBM's performance leader. Other PC

(continues on page 36)

ThinkTank Runs Under OS/2 and DOS: One Price, Two Versions



ANALYSIS

BY BARBARA KRASNOFF

When OS/2 was finally released last December, it was born into a world where no applications could run under it, except in the DOS compatibility mode. Much to everyone's surprise, the first program to make the transition to life under OS/2 is *ThinkTank*, a modest outline facility that has been on store shelves for years. And much to the relief of all, its publisher, Living Videotext, will not

charge a premium price for the new version.

While outliners are not exactly a staple of the software market, they have become fairly popular, especially as add-ons to fully featured word processors. *ThinkTank* was one of the first to be sold, and it hasn't changed much in the intervening years. Using a series of point-and-shoot menus (supplemented with some function key and keyboard commands), *ThinkTank* gives users the ability to move topics around a flexible outline format, expand or

contract the outlines, move text between files, and create "clone" outlines, in which changes to one will be reflected in the other. You can attach text to each heading with a simple, *WordStar*-like text editor; the manufacturer also includes several templates that enable *ThinkTank* to be used as a sort of primitive database.

ThinkTank for OS/2 does not differ substantially from its DOS twin. In its new package, Living Videotext (which is now a division of Symantec Corp.)

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Newest spreadsheet force brandishes hot links 34

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Surpass Costs Same as 1-2-3, Outperforms It in Every Way

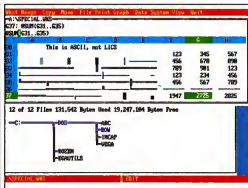
PC HANDS ON

BY JARED TAYLOR

If you've been looking for a 100-percent-Lotus-compatible spreadsheet that beats the pants off of Lotus 1-2-3, this may be it. *Surpass*, from Surpass Software Systems Inc., runs faster, looks prettier, works harder... and has exactly the same price. It comes with many of the features we expect to be in Release 3.0 of 1-2-3—spreadsheet linking, high-speed recalc, macro recording, better graphs, background recalc—and it's here today.

Compatibility is the rock on which many a 1-2-3 imitator has foundered. Not *Surpass*. This program swallows templates without a burp and ran the most weird and gnarled Release 2 macros I could throw at it. Hard pounding by power users may smoke out obscure bugs, but as far as I can tell, this baby is compatible (though see below).

If you turn on background recalculation, you don't even have to wait for the numbers to crunch before you can start work. *Surpass* pauses as soon as you touch a key and starts think-



Surpass (\$495) enables you to open as many windows as you can stand; its DOS shell (in the lower half of the screen) is always on call. The only incompatibility with Lotus 1-2-3 is *Surpass*'s use of ASCII characters, rather than LACS.

ing again as soon as you stop. *Surpass* also has minimal recalc, so instead of grinding through every formula, it updates only the ones that need to change.

The first time you recalc a worksheet after you load it into *Surpass*, it takes longer than every subsequent recalc during that session.

The reason for the speed difference is that during the first recalc, *Surpass* does a dependen-

cy analysis that figures out how the spreadsheet is put together and thinks about how to do dependency-based recalcs on subsequent runs. You see the benefits of that analysis when you do a recalc of a single formula.

But what should really sell this program is hot links, which let you refer in one spreadsheet to values in other spreadsheets. This means that you can build consolidation spreadsheets with formulas that refer only to the

PC FACT FILE

Surpass

Surpass Software Systems Inc.
250 Bel Marin Keys Blvd.,
Bldg. F
Novato, CA 94949
(415) 382-8840
List Price: \$495

Requires: 512K RAM, hard disk drive, DOS 2.0 or later.

In Short: A Lotus-compatible spreadsheet that significantly outperforms 1-2-3. Not copy protected.

CIRCLE 468 ON READER SERVICE CARD

key numbers in component spreadsheets. It also means that you can break down very large models into logical chunks. And since the data is not all stuck in a single spreadsheet, several people can work on the same model.

Surpass lets you run as many as 32 different spreadsheets in memory at the same time and watch them all in their own little windows. This is the easiest way to put hot links together, but their real advantage is in linking models that wouldn't all fit into memory together anyway. If you need a key piece of data from a spreadsheet that is out on disk, you can write a reference to it in the current sheet,

PC MAGAZINE

Performance Tests: Surpass vs. Lotus 1-2-3, Microsoft Excel, and Quattro

Surpass performs an analysis of a worksheet during its first calculation, so its first calculations are slow, but it works faster on subsequent calculations. Borland's Quattro and Lotus's Speedup also use an intelligent recalc.

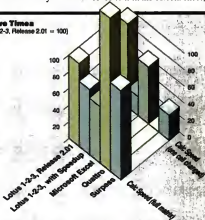
Performance Times

(Times given in seconds)

	Calc Speed (full matrix)	Calc Speed (one cell changed)
Lotus 1-2-3, Release 2.01	70.1	70.1
Lotus 1-2-3, Release 2.01, with Speedup	55.0	16.0
Microsoft Excel	48.0	48.0
Quattro	129.0	0.1
Surpass	75.0	21.5

The Calc Speed test spreadsheet contains 2,080 cells between A1 and Z80 with labels and with formulas that do four-function math and square roots. We ran this test two ways: changing a value that affects the full matrix, and changing a value that affects no other cell relationships.

Relative Times
(Lotus 1-2-3, Release 2.01 = 100)



and *Surpass* brings in just that piece for you.

But hot links are a one-way street. If you make a change in the current spreadsheet, *Surpass* won't go out to disk to update sheets that refer to it. If you save the current spreadsheet and then load one that refers to it, *Surpass* asks if you'd like to have the references updated. Most of the time, if you say yes, you'll get current values. But if you have a chain in which A depends on B, which depends on C, you may not get current values. If you make a change in C and then load A without loading B, A's values won't reflect the change in C. Still, one-way links are far better than none.

Two other godsend features are undo and string search. Undo does exactly what it should. Hit Backspace at the Ready state, and you get what you had last. Hit it again to toggle right back. String search lets you hunt either for formula components or for displayed labels or values. You can make the search case-sensitive if you want, and you can search for either whole-word matches or part matches. There's no replace function, so you have to make wholesale changes by hand.

Like all modern, self-respecting spreadsheets, *Surpass* can record keystrokes as macros and can run macros from libraries. Since they aren't locked up in single spreadsheets, you can use macros to automate operations across many spreadsheets. And the macro step function has a nice touch: as you tiptoe through the code, *Surpass* displays the current line of macro script at the bottom of the screen, and a highlight shows exactly which command is executing.

Surpass has much better graphs than 1-2-3, and you can print them straight from the screen without fussing with a special print program. You can change the colors of every part of the program, though it's too bad you can't make different spreadsheets show up in different colors. If you like to work with several spreadsheets at a time and have an EGA card, you can set up *Surpass* so that it al-

ways comes up in 43-line mode—a handy and very readable arrangement.

Finally, *Surpass* is wrapped inside a fairly sophisticated DOS shell. It draws a nice directory tree and lets you move files around, build and delete directories, change disks, that sort of thing. You have to go through it to get to *Surpass*, but even people who hate DOS shells will get used to it.

The accompanying screen shot hints at how *Surpass* isn't completely 1-2-3-compatible. The Lotus compose sequences (and the @char function) don't produce LICS characters; instead, they produce ASCII. But plenty of people like the drawing symbols better than leetland runes anyway.

Surpass lives up to its name. Unless you're a LICS lover, your models should all run perfectly, and you'll have more horsepower than ever. This will be a tough program for even Release 3.0 to match. [E]

ThinkTank

(continued from page 33)

includes both versions on a 3½-inch disk in separate subdirectories, along with the DOS version on a standard 5¼-inch disk; the OS/2-compatible program is installed with a special batch file. (Living Videotext will supply the OS/2 version on a 5¼-inch disk if you request it.) There is also a short explanatory section added to the product's standard READ.ME outline file that gives novice users a quick lesson in how to install *ThinkTank* on the OS/2 applications menu.

If you like, you can run *ThinkTank* in the DOS mode and in as many OS/2 sessions as your memory can hold. Cycling through them is as easy as OS/2's Alt-Esc combination (Ctrl-Esc calls up the OS/2 program selector, so you could start another *ThinkTank* session while in the middle of one).

Running *ThinkTank* on OS/2 does offer a few advantages. It allows you to open several outlines concurrently without any fuss. Because *ThinkTank* uses the OS/2 protected mode, it will

Who'll Pay for OS/2?

PC ANALYSIS

BY GUS VENDITTO

In a recent poll, *PC Magazine* readers said they expected that OS/2 programs would cost more than DOS applications. Yet these same readers felt it was unreasonable for software vendors to charge more.

Everyone who buys software should breathe easier to see that Living Videotext is charging absolutely no premium for its OS/2 version of *ThinkTank*. Of course, this, the first OS/2 application, does not push the new operating system to its limits (it uses neither multiple threads of execution nor interprocess communication) and required no large-scale programming effort. It's a straight port of the DOS version.

But it does prove that publishers can develop OS/2 programs without superhuman efforts. Only a few months ago, some pundits claimed that the programming effort OS/2 demanded would drive many innovators into bankruptcy, and that only the top publishers would survive.

WordPerfect Corp., for example, has assigned about a quarter of its more than 300 programmers to OS/2 work and has not yet even announced an OS/2 product.

Living Videotext, which recently merged with Symantec and Turner Hall, may not be the proverbial kid working out of a garage, but it's far from being a software giant.

And it now has the distinction of having set a very good example. Anyone for a trend? [E]

not permit you to run the same outline simultaneously, thus outlining the possibility of writing over the same file. Using *ThinkTank*'s cut-and-paste facility, you can pull text from one OS/2 application into another running concurrently, or, for that matter, into a DOS version if you desire. But this is not the powerful interprocess communication facility in OS/2 that so much is expected of *ThinkTank*'s cut-and-paste feature simply writes files to disk that other *ThinkTank* sessions, DOS or OS/2, can read from. Living Videotext has produced a very simple, straightforward port of the existing product and has made no attempt to exploit the complete power of OS/2.

Fair Pricing

Although there is something exciting about running the first application that works under OS/2, one can't help noticing that the advantages that OS/2 lends *ThinkTank*—specifically, cutting and pasting between two files—are already present in other outliners that contain decent windowing facilities. In a market in which outliners are now being included as part and

parcel of most major word processors, *ThinkTank*'s salability as an independent product may also be rather limited. However, you certainly have to give Symantec an A for effort, and for a reasonable pricing policy. [E]



FACT FILE

ThinkTank, Version 2.410S/2

Living Videotext Division
Symantec Corp.
117 Easy St.

Mountain View, CA 94043

(800) 441-7234

(800) 626-8847 (in Calif.)

List Price: \$195; upgrade, \$40.

Requires: 256K RAM, one

disk drive (two recommended),

DOS 2.0 or later.

In Short: The OS/2 version of

this somewhat outdated outliner

is very much like the DOS

version; it does, however, allow

users to run more than one

version concurrently. Package

comes with both DOS and OS/2

versions. Not copy protected.

CIRCLE 440 ON READER SERVICE CARD

PS/2 Model 80-111

(continued from page 13)

Labs processor benchmark tests yield similar results, all of which point to Compaq's implementation of a static RAM cache as a better idea than IBM's dependence on its new 80-nanosecond, 1MB chips and MCA bus design.

Making matters worse for IBM, Compaq's new VGA adapter and display outdistance IBM's PS/2 version by a healthy 3-to-1 performance margin.

PC
LABSFACT
FILE

IBM PS/2 Model 80-111

IBM Corp.

(Contact your local authorized IBM dealer)

List Price: \$10,995 with 70MB hard disk; \$3,495; 80387 coprocessor, \$1,195; 8503 monochrome display, \$250; 8512 color display, \$395; 2MB upgrade, \$1,295; external 5¼-inch 1.44MB disk drive, \$245; DOS 3.3, \$120; OS/2 Standard Edition 1.0, \$325.

In Short: IBM's new flagship for the PS/2 line, a 20-MHz 80386-based Micro Channel computer.

CIRCLE 448 ON READER SERVICE CARD

Ready, Set . . . First PS/2 Micro Channel Logic Chips Finished

PC PREVIEW

BY GUS VENDITTO

In December, we reported that two chip makers, Western Digital and Chips and Technologies, were along in their efforts to produce the system logic for the Micro Channel Architecture (First Looks, page 35, *PC Magazine*, December 8, 1987).

The cloning efforts continue on schedule. Chips and Technologies announced on January 20 that it's now ready to sell chips with PS/2 system logic to any hardware manufacturer prepared to build and market a PS/2-compatible computer.

And Phoenix Technologies,

the pioneer in writing a PC-compatible BIOS, said that its work is complete and the Chips and Technologies chip set can be ordered with a Phoenix BIOS.

Chips are available to build any of the PS/2s—a Model 30, 50, 60, or 80, according to Gordon Campbell, president of Chips and Technologies, the Silicon Valley design firm that rose to prominence when it produced the first widely available EGA chip set, leading to lower prices for EGA adapters.

The system logic chips include a system board VGA that is compatible with the hardware registers of the IBM VGA. Chips and Technologies has al-

ready shipped a VGA adapter chip set that is compatible only at the BIOS level.

Campbell said that the cost of PS/2 chips would be in line with the cost of PC chips; Phoenix said its BIOS would be licensed at rates that are comparable to the fees charged for the PC and AT BIOS.

Phoenix confirmed that Western Digital will also distribute a Phoenix PS/2 BIOS in the PS/2 logic chips that it is designing.

It's a little early to say exactly when a computer based on a Micro Channel Architecture might be sold by somebody other than IBM, but prototypes are now running and Chips and Technologies is betting that a computer manufacturer will have a saleable machine by the end of the spring.

IBM's original VGA is fast enough to persuade PS/2 disbelievers, but the new Compaq unit—if marketed separately by the company—could keep a lot of AT-class machines hopping along at a lively pace for a long time to come. And even when you're looking at the sharpness of character display, Compaq's \$1,000 VGA monitor/adapter combination offers a blacker screen background with higher contrast and better readability than IBM's top-of-the-line

\$1,550 high-resolution Color Display 8514.

The bigger (can you believe it?) disappointment is the PS/2's 115MB hard disk. The disk's new Enhanced Small Device Interface (ESDI) is supposed to provide superb performance, and while it's about 20 percent faster than an AT's 30MB drive, it's not nearly as fast as the 70MB drive installed in the Compaq. That drive reads and writes at least 30 percent faster

than IBM's, and more than twice as fast as the AT drive.

The good news is that you can buy the Model 80-111 for less than an equivalently equipped Compaq. But if it's raw performance you're after, you may not want to.

PC
LABS

Benchmark Tests: IBM PS/2 Model 80-111 vs. Compaq Deskpro 386/20 and IBM PS/2 Model 80-041

The Compaq's use of static-column RAM helped it beat IBM's 32-bit machine when the speed limit was 16 MHz. Now that both companies have machines running at 20 MHz, Compaq has stayed a notch ahead of the Micro Channel by using an Intel memory cache controller.

Performance Times

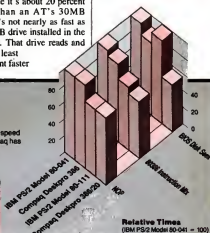
(Times given in seconds except where noted)

	NOP	80386 Instruction Mix	BIOS Disk Seek (milliseconds)
IBM PS/2 Model 80-041	2.1	4.3	33.0
Compaq Deskpro 386	2.1	4.0	28.5
IBM PS/2 Model 80-111	1.7	3.2	32.7
Compaq Deskpro 386/20	1.7	2.9	18.5

The NOP benchmark test is designed to measure raw clock speed and memory access time while minimizing differences in microprocessors and the effect of memory caching. This test results almost entirely in NOP ("No Operation") machine code instructions in a big 128K loop.

The 80386 Instruction Mix benchmark test measures the time it takes to execute a selected series of processor-intensive tasks. The test program uses 80386 instructions only. These instructions are a subset of the total processor instruction set. The 80386 instruction mix implements a number of 32-bit operations. In the 80386 processor these become single instructions, whereas in the 8086 and 80286 versions of the benchmark test they remain multiple instructions.

The BIOS Disk Seek benchmark test measures the time it takes to do a random seek using the disk's ROM BIOS. The test result includes minimal software overhead and may not parallel the manufacturer's claimed average access time. The test program performs 1,000 seeks. The average result is shown in milliseconds.



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Hijaak Converts Among .PCX, .PIC, and TIFF Graphic Formats

PC HANDS ON

BY TOM STANTON

Folks who think text file conversions are difficult ought to try sorting out the many incompatible graphic file formats (see sidebar "A Babel of Graphics"). Anyone who's done even a small amount of desktop publishing knows the frustration of losing the services of one library of graphic images because the software of choice can't support that format.

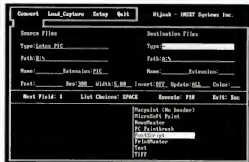
Into this Babel of standards comes Inset Systems, which fueled the desire to mix words and pictures with *Inset*, a text-graphics merging program for word processing. The company's latest, *Hijaak*, is a pair of utilities designed to capture screens as bit-mapped images and let you shuffle file formats among the current standards.

While *Hijaak* is a kind of stopgap measure, it is reasonably priced (\$89) and a useful tool for desktop publishers or artists who want to work on files from a variety of sources. There

is one "gotcha"—if you work a lot with color images, you'll also need *Inset* (for grabbing screens). The pair sells for \$149.

The file conversion utility supports bidirectional transla-

and ASCII (.TXT). There is also a destination-only transfer to Lotus .PIC or PostScript text file formats. Conversion is simply a matter of selecting source and destination filenames with appropriate extensions (.MAC



Hijaak's menu can simplify conversions, but you will probably prefer to run the program from the command line for quicker operation.

tion of a number of formats, including Amiga (.IFF), CompuServe (.GIF), Hewlett-Packard LaserJet (.HPC), MacPaint (.MAC), PC Paintbrush (.PCX), Dr. Halo (.PIC), TIFF,

to .PCX, .GIF to TIFF, and so on). Inset Systems plans to support IGES and HPGL formats in upgrades.

Vector-to-bit-map conversions are a bit more involved. The best method is to print the file to some known format and then convert to a bit map. For example, I plotted a *Freelance* file into .HPC format at 3000 dots per inch, then used *Hijaak* to convert it to .PCX format for editing and got excellent results. You can also use the frame grabber and then convert from *Hijaak* to the desired format, but that involves some editing.

There are some trade-offs in any conversion, and *Hijaak* makes this clear up front. For instance, most desktop publishers will want bitonal bit maps, so color images must be converted to gray-scale images before conversion. You'll need *Inset* to convert color to gray scales (another gotcha).

The frame grabber is a memory-resident utility that can be loaded and unloaded as needed. *Hijack* captures screens to a file

PC FACT
FILE

Hijack, Version 1.0

Inset Systems

12 Mill Pond Rd.

Danbury, CT 06811

(203) 794-0396

List Price: \$89

Requires: 40K RAM for capturing images, up to 300K RAM for converting images; one disk drive; CGA, EGA, Enhanced EGA, or Hercules Graphics Card; DOS 2.0 or later.


In Short: An interesting conversion tool at an excellent price for converting graphic images to and from most popular formats. Not copy protected.

© 2000 Blackwell Science Ltd, *Journal of Internal Medicine* 247: 161–167

using the by now familiar Shift-PrtSc. You can change the hot-key combination at will. Screens are saved in *Hijaak's* proprietary .PIX format. Monochrome screens can be converted from .PIX to any of *Hijaak's* supported formats, but color screens need to be massaged into gray-scale images with *Inset* before conversion.

I found *Hijaak* fairly convenient. A group of *MacPaint* files from the local bulletin boards were easily converted into .PCX and PostScript files, and back again, opening up a lot of images that I might not have considered before. If you've got a Mac and a PC, you will definitely want *Hijaak*, even if you don't use desktop publishing. I grabbed several text screens, converted them to .PCX format, edited them, then converted them to PostScript.

Color-to-gray-scale conversions worked well but proved a little tricky at first. A color screen captured in EGA can be converted to .PCX format and edited from color to gray tones, but *Hijack* doesn't do this automatically; Inset Systems promises to add automatic gray-scaling in a future release.

Hijaak is a worthwhile utility that deserves a place in the desktop publisher's toolbox. Considering all it can do, this is the conversion tool to use. 

A Babel of Graphics

With each new advance in technology, there's a price. In graphics, progress usually means a new file format.

Encapsulated PostScript and TIFF currently are floating about as potential image publishing standards. IGES, .PIC, .DFX, and .PCX have enjoyed wide popularity as de facto standards for years.

There are some vector-to-bit-map conversions available, but you lose detail in the process.

Bit-map-to-vector conversion is expensive and slow. TIFF promises multiple-gray-scale information, yet most scanners cannot offer more than 16 tones, and most use automatic dithering to produce bina-

bit maps in the more-popular paint formats.

Frame-grabber utilities have been around awhile, but most are designed for creating slides and overheads, so they've offered no standards and are of no help if you want to edit the captured image.

Access to Macintosh and Amiga files is useful, so a number of public and commercial utilities have been created for looking at those files on a PC (*Readmac*, from Micro Technologies of Belleville Illinois, is probably the most popular).

Anyone who needs to integrate a variety of graphics into a single document understands how valuable a utility like *Hi-zook* can be. —Tom Stanton

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CIRCLE 157 ON READER SERVICE CARD



Disk Optimizer. The original un-fragment software now has un-format. Un-believable!

It's still the safest, most effective way to put the zip back in hard disk performance.

For more than two years now, Disk Optimizer has helped PC users everywhere safely restore and maintain the smooth, slick, fast performance of their hard disks.

And now there's a new and improved Disk Optimizer that un-fragments files even more effectively. And includes enough additional disk management tools to make it one of the best software values anywhere.

So, who needs Disk Optimizer, anyway?

Simply everyone who owns a hard disk and relies on the speed and convenience it gives them.

That's because DOS is constantly slowing your hard disk down. It does it by breaking files up into pieces. Storing different chunks in different places. And that makes everything slower—loading, sorting, retrieving, backing up—because your hard disk has to chase all around to read and write different pieces of your file.

Disk Optimizer restores the speed of your hard disk by putting files back together in one contiguous piece—where they belong.

Disk Optimizer is absolutely, positively "disaster proof."

It's sad but true. Some other un-fragmenting software could lose your data if something goes wrong in the process. Like a routine reading or writing error. Or even a power failure.

But have no fear with Disk Optimizer. Nothing will go wrong because nothing can go wrong. Even if you yank the plug from the wall in the middle of the program. It's because only Disk Optimizer copies each file, piece by piece, then checks the newly un-fragmented version for completeness. Only then does it go back and erase the fragmented version. Not power spikes, disk failures or DOS errors—not even earthquakes—can cause data loss. And only Disk Optimizer makes you that promise. So why trust your disk to anyone else?

It's like a precision tune-up for your disk.

In addition to un-fragmenting, Disk Optimizer also lets you quickly choose the optimum layout for your disk. So your most-used files have the fastest access. And program and other unchanging files can be permanently un-fragmented and set aside on their own area on the disk.

The simple menu makes it a snap. Un-format—one of the powerful new reasons to buy Disk Optimizer.

Oops! Make a simple mistake at the keyboard and you could wipe out your hard disk with a DOS Format command. But don't worry. "Un-format" will recover your entire disk, and all your data, in just moments. It's included with your new Disk Optimizer.

Plus, you get the new "Analyze" program with a graphical display that shows your disk's condition so you'll always know when it's time to optimize again. You also get "Sorts" for organizing directories for the best appearance and sequence. "Findfile" for searching out hard to find files. "Delfile" for locating and erasing unwanted files. "Lock" and "Unlock" for file security. And more.

You could spend hundreds on other utilities and still not get all the functionality packed into Disk Optimizer at no extra charge.

Use it once and you'll discover what nearly 200,000 users already know—\$69.95 is a small price to pay for the speed, convenience and safety you get only with Disk Optimizer.

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Just a few of Disk Optimizer's rave reviews:

Selected PC Magazine's "Best Of The Best" utilities.
—June 1987

"I find Disk Optimizer excellent. Disk access, even at 4.77MHz, is much faster. And loading 100 Fantasy fonts now takes seconds."
—Elizabeth Joan Doyle, Indiana

"I feel this is essential software for anyone with a hard drive."
—D. Sorenson, Texaco, California

"Easy to install, use, and most importantly, it works!"
—Dan Nielsen, General Electric Information Systems, NY

2 Disk Optimizer \$69⁹⁵

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#6

Perma Power SPS500 Backup Kicks In Fast, Recharges Fast

PC HANDS ON

BY WINN L. ROSCH

The virtues of a standby power system are about the same as those of a brick: although ungla-morous, both should be reliable enough that you can forget about them. Finding either one endowed with innate intelligence sounds absurd—until you investigate Perma Power Electronics' SPS500.

A \$799 standby (as opposed to uninterruptible) power system, the SPS500 switches to battery-supplied electricity to run your PC when the line voltage fails. Juice flows in through the permanently connected line cord, and protected current waits at the four outlets on the rear panel.

Inside the steel case you'll find a big 6-volt, 10-amp-per-hour lead-calcium battery, a transformer, and a large circuit board. Only the size of the board and the bevy of bright

LEDs on the front panel hint at how the SPS500 is different.

It switches to battery power not only when line voltage fails, but when the voltage gets either too low or too high. The SPS500 also guards against faulty outlets by preventing operation if the electrical supply is not properly grounded or wired. Additionally, the SPS500 suppresses spikes and surges with two stages of protection, including metal oxide varistors in all three modes.

Because the SPS500 switch-



es quickly (1 millisecond is the rate claimed), any computer—including the most finicky XT—will keep purring along should the SPS500 switch control to its backup.

Another clever feature helps speed up battery recharges. When you invert its inverter section, the SPS500 can take advantage of its hefty transformer to recharge itself in about 3½ hours.

The system's rated capacity is 500 watts, and the SPS500 warns you with a glowing red LED if you exceed that limit. The SPS500's internal battery is good for 8 minutes' operation at full power.

When only a minute of charge remains during backup operation, the SPS500 warns you by changing the slow beep of its audible power-off warning to a fast beep. When its resources are drained, it shuts off abruptly, eliminating the possibility of damage from an under-voltage run-down.

PC FACT FILE

SPS500

Perma Power Electronics Inc.
3601 W. Howard Ave.
Chicago, IL 60648
(312) 647-9414

List Price: \$799

In Short: An intelligent stand-by power system with fast (1-millisecond) switching time, under- and overvoltage, surge, and spike protection; and rapid recharging.

CIRCLE 433 ON READER SERVICE CARD

Besides being UL-listed, the SPS500 is stylish enough to sit on your desk, matching an old PC (rather than AT or PS/2) in color and front-panel angle, but much more compact at 5½ by 8 by 16 inches. Because of its heavy battery, however, you'll prefer to put it at your feet.

For something as mundane as a standby power source, the SPS500 is technically glamorous enough to wear sunglasses. Its clever design makes it a good choice for protecting almost any personal computer system.

Connex Simplifies E-Mail Correspondence

PC HANDS ON

BY MERV ADRIAN

Connex, from Productivity Performance, was designed for people who have to communicate extensively with clients, information services, and organized data structures but don't have a lot of time to put into it. The program offers a stunning array of facilities for communications management, maintaining information on each of your electronic mail services (MCI Mail, AT&T, Western Union's EasyLink, and so on). Setting up your accounts is relatively painless; letterheads and signatures are supported if the service offers them, and sending mail can be automated and easy.

The Administrative Assis-

tant function—one of five on the main menu—includes your Infodex, which records data about each client or contact. Mail merge and extensive reporting facilities are provided.

Connex understands most popular word processor formats, so you don't have to type on-line or convert before uploading.

One of the more-powerful modules, the Information Service, allows you to create extensive scripts for automated retrieval and to download from services like CompuServe or The Source.

The Hot Wire option has a group of real time-savers. If you want to know whether a new prospect is on any of the services you use, select 411, and Hot Wire will call them all.

Connex supports Xmodem and X.25 and can communicate with minis and mainframes.

The Special Delivery option is a check of your mailboxes. Here's my first quibble: Connex has no timed execution facility or background operation—a major flaw. Productivity Performance promises to provide this capability to customers requiring it, however.

The cost in disk space is the other major problem. You must reserve 3.5MB for this baby.

Nevertheless, \$199.95 is a very good price for such a full-featured communications package. If electronic mail, information retrieval, and micro-to-micro, -mini, and -mainframe communication are important parts of your business, Connex should get a hard look.

PC FACT FILE

Connex

Productivity Performance Inc.
214 Colton St.
Newport Beach, CA 92663
(714) 631-0515

List Price: \$199.95

Requires: 640K RAM, 3.5MB hard disk drive. Hayes-compatible modem, DOS 2.0 or later.

In Short: Designed to streamline telecommunications for business correspondents, this program converts word processing documents and sends mail automatically. Not copy protected.

CIRCLE 434 ON READER SERVICE CARD

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P-9	1035
Okidata	
Panasonic	Call
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341SL	955
351 Model II	895
351 Color	1629

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85	364

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QUICK LOOKS

Programmers' Pinup: ASCII and More

PC HANDS ON

BY JONATHAN MATZKIN

If you took high school chemistry, you probably saved a lot of time thumbing through reference books for information by checking the periodic table of elements that adorned a classroom wall. The Topspot Programmer's Reference Chart is exactly the same kind of tool.

It consolidates some of the most needed programmer's reference material, in a large (24-by-35½-inch), easy-to-scan wall poster. Of course, there's an ASCII table with the IBM higher-order characters, including a diagram that shows the ASCII characters used for box drawing. If you need to know that 191 is the decimal equivalent of the ASCII character for the lower-left corner of a box,

A portion of the Topspot Programmer's Reference Chart that depicts the ASCII values for box-drawing characters. The chart also sports ASCII values for letters and higher-order characters, as well as keyboard scan codes and musical note frequencies.

you simply eyeball the lower-left corner of the diagram.

For assembler programmers, there's a table of base number conversions. A diagram of the standard 84-key keyboard displays the scan codes mapped to each key.

Not an everyday need for most programmers, but valuable nonetheless, is the listing of musical frequencies for the 88 notes of the piano keyboard. The Topspot chart is rounded out by a list of PC hardware color codes.

The Topspot Programmer's Reference Chart lets you leave some of those heavy reference books on the shelf, where they look impressive and don't take up desk space.

List Price: Topspot Programmer's Reference Chart, \$15. Quantity discounts available. Topspot, P.O. Box 881, Marion, IA 52302; (319) 377-0207.

CIRCLE 445 ON READER SERVICE CARD

FastAccess: A WordPerfect Primer

PC HANDS ON

BY MITT JONES

The idea behind *Fast Access/WordPerfect*, one of the latest *WordPerfect* how-to books, is not to give you more than the *WordPerfect* manual, but to give you less.

Drawing from his experience as a computer consultant, author Rhyder McClure avoids esoterica and concentrates on the features "95 percent of us use 95 percent of the time."

The result is a spiral-bound 200-page book that serves nicely as a quick reference and includes instructions for building 11 useful *WordPerfect* macros.

Like the reference section of *WordPerfect's* manual, *Fast Access/WordPerfect* covers topics alphabetically under easy-to-spot subject headings. For each *WordPerfect* feature he covers, McClure presents a

brief explanation, lists related features, and adds nicely presented examples.

If you need more information or explanation than *WordPerfect's* on-line help and docu-

mentation provide, steer clear of *Fast Access/WordPerfect*. But if all you need is a less bulky reference than the *WordPerfect* manual, *Fast Access/WordPerfect* may be for you.

List Price: *Fast Access/WordPerfect* by Rhyder McClure (ISBN 0-13-307489-7), \$12.95. Brady Division, Prentice-Hall Press, Gulf + Western Bldg., One Gulf + Western Plaza, New York, NY 10023; (212) 373-8093.

CIRCLE 444 ON READER SERVICE CARD

Easier Entry: An AT Keyboard for PS/2s

PC HANDS ON

BY MITT JONES

IBM's 101-key keyboard finally gave many PC users what they craved: separate numeric and cursor-control keypads. But for those of us who process words rather than crunch numbers, the 101-key keyboard was a step backward from the 84-key, original AT-style keyboard. The all-important function keys jumped to the wasteland above the already-troublesome-to-reach numeric

keys, and the equally important Ctrl and Alt keys did a bit of jumping themselves.

IBM has left it to third-party manufacturers to supply AT-style keyboards to those who insist on the 84-key layout. U.S. Keyboards, a wholly-owned subsidiary of Key Tronic, wins the race to supply the first PS/2-compatible AT-style keyboard. U.S. Keyboards supplies the \$89 keyboard and sells, as an option, a \$7.95 PS/2 adapter.

The U.S. 84 uses rubber-dome key actuators rather than the coiled springs IBM users are

accustomed to. Imagine poking a low-density marshmallow, add a subtle click, and you've got the keyboard feel about right. But the U.S. 84 offers enough resistance and bounce to keep me happy. And if you find you can't live with the feel, you can replace the 2-ounce rubber domes with stiffer domes or with coiled springs.

List Price: U.S. 84, \$89; PS/2 Adapter, \$7.95. U.S. Keyboards, P.O. Box 14916, Spokane, WA 99214; (509) 927-5207.

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Here's what the critics say:

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Esther Dyson, Industry Analyst

"Absolutely the best small accounting program made." *Bob Schwaabach, Universal Press Syndicate*

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Intuit PC 288

The Macintosh as Terminal: PC MacTerm Runs DOS on a Mac



HANDS ON

BY M. DAVID STONE

From the moment the first remote operations program for the PC was conceived, it was inevitable that someone would write a program to let the Mac act as a remote terminal for an IBM computer.

Well, the inevitable has arrived. It goes by the name *PC MacTerm* and was developed by Dynamic Microprocessor Associates of New York, which is also responsible for the remote operations program *PC Anywhere* (see "Remote Computing: The Next Best Thing to Being There," *PC Magazine*, January 12, 1988). In a sense, *PC MacTerm* is an extension to *PC Anywhere*. It runs on a Mac to let the Mac call into a *PC Anywhere* host and run application programs remotely on the host. Basically, *PC MacTerm* receives screen control codes from the PC and converts them into screen control codes for the Mac. It also lets the Mac keyboard produce the special key codes—such as Home, End, and function keys—that give PC programs their marching orders.

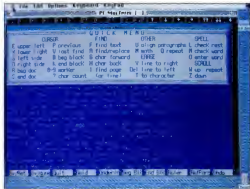
Using *PC MacTerm* to control a PC remotely is so much like using the PC directly that

there is hardly anything to say about it other than that it works. Once communications are established—a procedure much like using a standard communications program—you might as well be typing at your PC or AT keyboard, except for the concessions you need to make to the Mac's keyboard.

In my tests I used the program on a color Macintosh II with System 4.2 and *MultiFinder*, Version 1. Running several programs, including *The Norton Utilities*, a DOS shell, *Lotus 1-2-3*, and indeed,

working in DOS itself, the most notable impression I have of the systems' behavior was that nothing unusual happened. Even the colors matched what you would expect to see on a PC. Performance at 2,400 bits per second was about the same as when using a PC as a remote terminal at 2,400 bps.

PC MacTerm has some nice design touches. For example, to make up for the lack of function keys on the Mac keyboard, the program paints the function keys across the top line of the screen, where you can "press"



This Macintosh II is not running WordStar, although for all practical purposes it might as well be. *PC MacTerm* on the Mac is connected at 2,400 bits per second to an IBM PC AT, which is running *PC Anywhere* and WordStar. *PC MacTerm* enables you to choose from among these four font sizes for your Mac display.



FACT FILE

PC MacTerm, Version 1.10

Dynamic Microprocessor Associates of New York
EKD Computers
764 Middle Country Rd.
Selden, NY 11784
(516) 736-0500
List Price: \$99

Requires: Apple Macintosh System 4.1 or later; IBM PC or compatible running *PC Anywhere*; serial port for direct connection, modem for remote connection.

In Short: A communications program for the Mac that gives a Mac control over a PC running *PC Anywhere*. Not copy protected.

CIRCLE 488 ON READER SERVICE CARD

them by pointing and clicking the mouse. On the standard Apple keyboard, *PC MacTerm* maps the Home, End, Num-Lock, and other keys to the cursor keypad, exactly where they would be on the IBM numeric keypad. Alternatively, you can pull down a menu that looks like the IBM numeric keypad, and you can "type" the keys using the mouse. The program also works under *MultiFinder*, so it can run in the background to transfer files.

PC MacTerm is probably not the last bridge to be built between PCs and Macs but, right now, it's probably the best. ☐

A Better Way to Manage Time



HANDS ON

BY PEGGY GAVAN

Desktop calendars are great for doodling on and for soaking up coffee spills, but they make lousy appointment schedulers. And token calendar utilities such as those found in *Home-Base*, *SideKick*, and *Metro* don't do much better.

Primetime Personal combines appointment and task

scheduling in a flexible configuration that allows you to schedule events up to the minute. An Auto appointment feature lets you track regularly recurring meetings (third Tuesday of the month, for instance) with no effort. Well-designed reports can be printed for to-do lists and appointments for any time period you want.

Primetime also features a telephone directory with an automatic dialer, plus an audi-

ble warning message that warns you if you attempt to schedule two appointments at the same time.

Primetime does not have any password protection, and you can attach only five lines of notes to each appointment or thing-to-do. However, *Primetime's* capabilities, plus its use of Alt-key combinations to move quickly through data files, make it quite an attractive package. ☐



FACT FILE

Primetime Personal

Wiseware
3176 Pullman St., #106
Costa Mesa, CA 92626
(714) 556-6523
List Price: \$99.95

Requires: 350K RAM, one disk drive, DOS 2.0 or later.

In Short: A time-management program with RAM-resident option. Not copy protected.

CIRCLE 489 ON READER SERVICE CARD



When you need to move quickly among programs and files, Software Carousel™ carries the load for you.

Why get dragged down by that old PC technology?

Despite the sophistication of today's PCs, there's one thing they still don't do. And that's work the way people work. Jumping from one task to another—from budgets to memos to phone calls and back. Consolidating, cross-referencing, copying and combining.

So every time you need to change programs—or just look at another file—it's the same old, tiresome routine—saving, exiting, loading, retrieving. Not very convenient. Not very human.

But now you have a choice. Either wait for the "next generation" of PC software. Or use Software Carousel, and get the speed and convenience you need today, with the software you already own.

Here's how to make Software Carousel work for you.

Software Carousel is the amazingly easy way to switch almost instantly from WordPerfect to 1-2-3 to dBASE to whatever else you want. Or go from one file to another in the same program. All without saving or retrieving—or wasting a precious moment of your time. Or your computer's memory.

Software Carousel works by creating a number of independent software slots to load your programs into. You get up to ten of these software slots, so you can load up to ten programs.

Need to crunch numbers? Hit a key and there's your spreadsheet. Need your word processor? Don't bother saving your spreadsheet file. Just whip over to your document and do your work. Snap back to your spreadsheet and it's just like you left it. It's like all your programs are "pop-ups," just a hotkey away.

Or load the same program into three different slots, each with a different file. Now go from one to another in a tenth the time it would take any other way. And with the wonderful feeling that, suddenly, your computer is working right along with you, not against you.

Here's the best part of all.

You may have heard about some other "environment" programs out there that claim to do something similar to Software Carousel. But there are several important differences.

First, they make you split your memory up among the programs you want to use. Software Carousel lets you use all available memory in each and every program, each and every file. It even supports expanded and extended memory.

Other environment programs work with only some software. Software Carousel works with everything. Period. It even resolves conflicts among memory resident programs.

Other software creates a memory intensive working environment that's complex, unfamiliar, with cramped little windows and strange commands. Software Carousel takes minutes to set-up exactly the way you want it. All your software looks and acts exactly as it always did, so you can concentrate on your job, instead of high technology. **It's so downright useful, even IBM® recommends it.**

Even as you read this page, there are tens of thousands of Software Carousel users out there tipping through their work without laborious and repetitive commands. And without the usual 640K limit imposed by DOS. In fact, even IBM recommends Software Carousel for use with their most popular mainframe-to-PC communications package.

We think you'll agree, that with this kind of speed, convenience, and next-generation performance, \$59.95 is a small price to pay.

Look for Software Carousel at software dealers everywhere. Or order direct from SoftLogic Solutions by calling us toll-free. If, after thirty days, you're not satisfied that Software Carousel is the right way to get old PC technology off your back, we'll gladly arrange for a refund of your purchase price.

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"Can't believe how well it works. Who needs 80386?"
—Ralph Evans, Attorney, Fullerton, CA

"Unlike other attempts (e.g. MS Windows, DesqView) yours works, is not fragile and does not intrude its 'personality' on everything that we do."
—Colin Ralph, Ralph & Partner, Inc., Seattle, WA

"Fantastic program. Great book. Saves me an hour a day! Thanks."
—Larry Pearl, Rolling Hills Covenant Church, Rolling Hills Estates, CA

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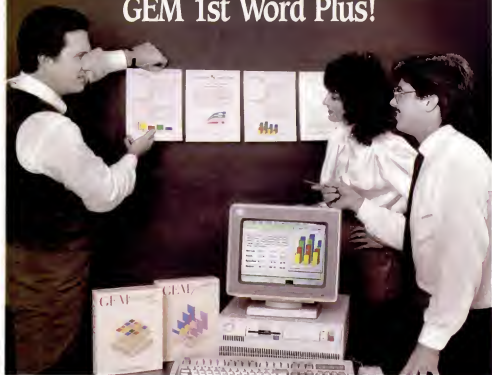
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CIRCLE 743 ON READER SERVICE CARD

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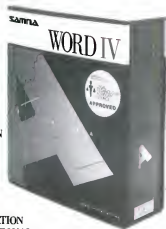
- GENERAL MOTORS
- ANHEUSER BUSCH
- GTE
- TEXAS INSTRUMENTS
- NASA
- U.S. SECRET SERVICE
- U.S. NAVY
- CHEMICAL BANK
- VANDERBILT UNIVERSITY
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NEW ON THE MARKET

DigiBoard's Pairing of Multi-User and I/O Boards Permits 32 Remote Sessions

DigiBoard is introducing intelligent add-in boards for PS/2 Models 50, 60, and 80 that allow up to 32 channels or terminals to use one microprocessor through RS-232 ports.

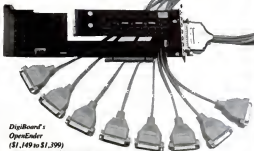
The OpenEnder is an L-shaped board that uses one slot and accommodates a complementing I/O board, the I/O Mate. I/O Mate models can provide either four or eight asynchronous ports.

A 12-MHz 80286 processor uses 256K of dual-ported RAM in managing interrupt conflicts

among the lines. DigiBoard claims this makes the OpenEnder four times faster than unintelligent multiuser boards.

List Price: OpenEnder with I/O Mate-8 (eight asynchronous ports), \$1,349; with I/O Mate-8 Plus (with synchronous port), \$1,399; with four ports, \$1,149; with four ports and an asynchronous port, \$1,199. **Requires:** IBM PS/2 Model 50, 60, or 80. DigiBoard Inc., 6751 Oxford St., St. Louis Park, MN 55426; (612) 922-8055.

CIRCLE 436 ON READER SERVICE CARD



DigiBoard's OpenEnder (\$1,149 to \$1,399) with its I/O Mate lets you connect eight channels to one PS/2 Model 50, 60, or 80.

Core's 310-Mbyte ESDI Hard Disk Drive Boasts 17-Millisecond Access

Core International has introduced a 310MB hard disk, the Core HC310, for PS/2 Models 60 and 80. A version for AT-bus PCs is also available.

The \$6,495 HC310 provides 17-millisecond access time through an ESDI interface; IBM's stock drives are rated at 30 ms.

Core is bundling GIGAFile with the HC310 hard disk drive; this software allows the entire drive to be partitioned as one volume and lets you join disks into one virtual disk of up to 1,000MB. Core also includes software that provides Novell

and Xenix compatibility.

List Price: Core HC310, \$6,495. **Requires:** IBM PS/2 Model 60 or 80 or AT-bus computer. Core International Inc., 7171 N. Federal Hwy., Boca Raton, FL 33487; (305) 997-6055.

CIRCLE 435 ON READER SERVICE CARD



The Core HC310 for PS/2 Models 60 and 80 gives more memory storage space than the Compaq Deskpro 386/20's disk.

WYSIfonts! Displays Soft Fonts in Ventura Publisher and Windows

SoftCraft, of Madison, Wis., has produced a program that takes soft fonts from Hewlett-Packard and Bitstream and constructs screen fonts to match printer output.

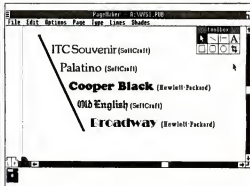
WYSIfonts! sells for \$95 and works with Microsoft Windows, Ventura Publisher, and Aldus's PageMaker for the IBM PC in any screen resolution. Its menus automate the installation procedure for soft fonts, installing

both printer and screen formats. SoftCraft throws in a 20-point Old English font at no charge.

List Price: WYSIfonts!, \$95.

Requires: Ventura Publisher, Version 1.1, with HP, AST, Cordata, or J Laser printer; or Aldus's PageMaker or Microsoft Windows with HPPCL driver for LaserJet Plus and compatible printers. Not copy protected. SoftCraft Inc., 16 N. Carroll St., #500, Madison, WI 53703; (800) 351-0500, (608) 257-3300.

CIRCLE 438 ON READER SERVICE CARD



WYSIfonts!, at \$95, displays any Bitstream, Hewlett-Packard, or SoftCraft printer typefaces on-screen. Here it is running under Microsoft Windows.

OS/2 Graphics Development Toolkit Will Operate Alongside Presentation Manager

Graphic Software Systems has announced the final version of its OS/2 development kit, which contains over 65 functions for bit-mapped and vector graphics. The GSS Graphics Development Toolkit will be compatible with the as yet unreleased Presentation Manager for OS/2. GDT, like PM, can be an end-user environment, but unlike PM, GDT will not manage windows, making it much faster.

GDT will be able to accommodate OS/2's multitasking, virtual memory, and SAA (Systems Application Architecture) microcomputer-to-mainframe connection in a way that is

transparent to programmers.

GDT, which will be marketed by IBM as well as by GSS, has language interfaces to C, FORTRAN, Pascal, BASIC Compiler, and Macro Assembler.

List Price: GSS Graphics Development Toolkit for OS/2, \$695. **Requires:** 1.5MB RAM, two disk drives (hard disk highly recommended), 80286 or 80386-based computer, OS/2. Not copy protected. Graphic Software Systems Inc., 9590 SW Gemini Dr., Beaverton, OR 97005; (503) 641-2200.

CIRCLE 437 ON READER SERVICE CARD

by Michael W. Muchmore

The Hyundai Super-286 file server features 12 option board slots and five half-height disk drive compartments.



Hyundai's Super-286 Server Sports a Dozen Slots and 5 Disk Bays

Hyundai Electronics America now wants to be a factor in your LAN with its Super-286, designed to be a high-capacity file server.

The Super-286 can also be used standalone for applications requiring a lot of memory storage and add-in boards. It boasts six 16-bit and six 8-bit expansion slots and room for five half-height disk drives. Hyundai offers 20-, 30-, 40-, and 70MB hard disks for the Super-286.

The microprocessor switches between 8 and 10 MHz and has no wait states. You get 1MB RAM on the motherboard, a socket for an 80287 coprocessor, a 1.2MB floppy disk drive, and a 101-key keyboard for the \$1,999 price tag.

A monitor and video adapter card are not included.

List Price: Hyundai Super-286, \$1,999. Hyundai Electronics America, 4401 Great America Pkwy., Santa Clara, CA 95054; (408) 980-7561.

CIRCLE 441 ON READER SERVICE CARD

Diamond Spreadsheet From Mosaic Software Has a Word Processor

It hasn't settled its lawsuit with Lotus Development Corp., but Mosaic Software is at it again,

trying to better Lotus 1-2-3 while claiming perfect file compatibility.

Diamond has the usual spreadsheet functions, plus a word processor, an 80,000-word spelling checker, a thesaurus, and improved graphics functions. The spreadsheet, graphics, and text can be integrated on a page, Mosaic says.

The spreadsheet is 8,192 rows by 256 columns, and it's compatible with 1-2-3, Releases 1A and 2. It has 8087 and 80287 coprocessor support.

List Price: **Diamond**, \$195.

Requires: 370K RAM, one disk drive, DOS 2.1 or later. Not copy protected. Mosaic Software, 1972 Massachusetts Ave., Cambridge, MA 02140; (617) 491-2434.

CIRCLE 447 ON READER SERVICE CARD

Rayovac Replacement Battery Powers Clocks In 286, 386 Machines

Rayovac Corp., the third-largest battery manufacturer in the United States, is now making a replacement battery to power the clocks in 286- and 386-based PCs.

Rayovac claims that its Model 844 lasts 25 to 45 percent longer than standard lithium models.

Standard batteries list at about \$27, as compared with Rayovac's list price of \$18.

Supplies of the Model 844 will be abundant.

The Model 844, unlike the Tadiran lithium battery, doesn't drain power while the system is running.

List Price: Rayovac Model 844, \$18. Rayovac Corp., 601 Rayovac Dr., Madison, WI 53711; (608) 275-4693.

CIRCLE 440 ON READER SERVICE CARD

HOT PROSPECT

Silverado, a Relational Database, Attaches to Lotus 1-2-3, SuperCalc4

Computer Associates International, the developer of **SuperCalc4**, is introducing **Silverado**, which lets you window into database files and use a wide range of DBMS functions from within a 1-2-3 or **SuperCalc4** spreadsheet. **Silverado** has strong reporting power and "database outlining"—the ability to view data on varying levels of detail (for example, all subtotals by month).

The \$149 **Silverado** allows other views besides the basic Spreadsheet view: Form, Crosstab, and Report views are available, and they can be edited and reported from.

You generate reports through menu commands rather than a report specification language. Totalling, formatting, and background processing are featured in **Silverado**'s report generator.

Silverado can import data

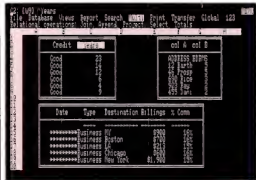
from 1-2-3, **SuperCalc4**, **dBASE III**, and ASCII text files. Dynamic linking between the spreadsheet and database can update spreadsheet data as it is entered into the database. Relational capabilities of **Silverado** include Join, Append, Project, and Select commands.

It supports expanded memory and automatically swaps to disk data that is greater than RAM capacity. **Silverado** can use macros and 1-2-3's @ functions, and it provides ten additional @ functions that allow 1-2-3 to draw records from the database.

List Price: **Silverado**, \$149.

Requires: 512K RAM, two disk drives, 1-2-3 or **SuperCalc4**, DOS 2.0 or later. Not copy protected. Computer Associates International Inc., 2195 Fortune Dr., San Jose, CA 95131-1820; (408) 432-1727.

CIRCLE 438 ON READER SERVICE CARD



Computer Associates International's Silverado shows three databases open at once while in a worksheet. Silverado swaps data to disk if it exceeds available memory.

PC UPDATE

edited by Peggy Gavan

The Norton Guides, OS/2 Kernel

The Norton On-Line Programmer's Guides Reference to the OS/2 Kernel API, the latest addition to the *Norton Guides* series, provides pop-up access to Microsoft's OS/2 documentation. The database covers the four OS/2 function groups: DOSx (system and file services), KBDx (keyboard services), MOUx (mouse services), and VIDx (video screen services), in addition to providing a reference section for programmers learning OS/2. The *Norton Guides Engine* instant access program and *OS/2 Kernel API* database are available in a package for \$150. The database alone is priced at \$100. A guide for the OS/2 Presentation Manager is currently in the works. Peter Norton Computing Inc., Santa Monica, Calif.: (800) 451-0303 (ext. 40).

TurboTax, Personal/1040, ProSeries/1040

The 1988 version of *TurboTax* has several new features, including on-line IRS instructions, dot matrix printer support, and a free copy of the Price Waterhouse Personal Tax Advisor guide to 1987 and 1988 taxes. The *Personal/1040* version of *TurboTax* is priced at \$75, or \$37.50 for registered users of earlier versions. The 1988 version of *TurboTax ProSeries/1040* is also now available for \$295. Upgrades are \$147.50 for registered users. ChipSoft Inc., San Diego, Calif.: (619) 453-8722.

SlideWrite Plus, Fonts and Figures 3-Pack

Advanced Graphics Software is now offering three new accessory products for use with *SlideWrite Plus*, Version 2.0. The *Fonts and Figures 3-Pack*, available for a limited time for \$99, includes a library of 230 new figures, ten new fonts, and a figure-maker utility. Following the introductory offer, the three programs included in the 3-Pack—*Fonts and Figures 1*, *Fonts and Figures 2*, and the *Figure Maker Utility*—will be priced at \$79, \$59, and \$45, respectively. Advanced Graphics Software, Sunnyvale, Calif.: (408) 749-8620.



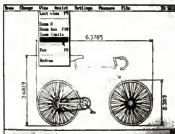
Fonts and Figures 2, part of the Fonts and Figures 3-Pack, includes 10 new fonts for use with SlideWrite Plus 2.0.

Dan Bricklin's Demo II

Dan Bricklin's Demo II program adds more than 75 new features to the original *Demo* program, including the ability to capture bit-mapped graphic images from other programs, string and numeric variables, and an enhanced run facility with more than 100 new actions to execute while running. The new version of *Demo* also includes an expanded manual, an on-line tutorial, and a runtime license to make unlimited copies. *Demo II*, which is priced at \$195, is available to registered users for \$54.95, plus \$4 shipping and handling. The original program is still available for \$74.95. Software Garden, Newton Highlands, Mass.: (617) 332-2240.

AutoSketch, Version 1.02

AutoSketch, Version 1.02, features two new commands that allow users to create snapshots of their drawings and then import them into their desktop publishing systems. The new release also supports the IBM Graphics Printer



AutoSketch, Version 1.02, allows users to import snapshots of their drawings into desktop-publishing systems.

and compatibles and the Hercules InColor Card graphics adapter. *AutoSketch* retails for \$79.95 or \$99.95 for the speed-enhanced version; upgrades are priced at \$15 for registered users. Autodesk Inc., Sausalito, Calif.: (800) 223-2521.

IN BRIEF

Connect Computer Co. is shipping new models of the *WonUnder* expansion unit for Toshiba's T1100 Plus and T1200 portable computers. The *WonUnder*, which is priced at \$349, was previously available only for the Toshiba T3100 computer. Connect Computer Co., Eden Prairie, Minn.: (612) 944-0181. . . . *Extra!*, Version 1.2, adds IBM APL2 support, background DISCOS file transfer, and optional software, including a Gateway Option (\$50), an S3G Graphics Option (\$595), and a Vector Graphics Option (\$695). *Extra!* is priced at \$425, and upgrades are free to registered users. Attachmate Corp., Bellevue, Wash.: (206) 644-4010.

BORLAND

Total amount enclosed

Books in Print on Compact Disk: Easy Title And Review Searches

PC HANDS ON

BY DONALD B. TRIVETTE

The R. R. Bowker Co. of New York City has been publishing its venerable *Books in Print* reference volumes on compact disk for a few years now. The latest form, *Books in Print Plus*, adds a much-improved search engine that is sure to delight librarians, bookstore managers, and professional researchers. Bowker Electronic Publishing puts 770,000 book titles, cross-references, ordering information, and 30,000 book reviews on a single CD—the same shiny media that holds an hour of Beethoven symphonies or Billy Joel melodies.

The newest electronic version of *BIP* comes with software that allows your PC to perform searches you just can't do with the hard-copy edition—even with a powerful magnifying glass to read the small print. With almost no instruction, you can search the database by author, subject, keyword, title,

and publisher; with a little practice, you can combine multiple search terms to quickly focus on any topic. Once you have the field narrowed, pressing the F10 key displays a list of brief citations.

A Browse feature lets you page through the database by author, keyword, publisher,

subject, title, or series title.

For the more-popular titles, Bowker has collected reviews from *Booklist*, *Choice*, *Library Journal*, *Publisher's Weekly*, and *School Library Journal*. You have only to press a key to read the full text of the critics' yeas and nays. As attractive as this system would be to stu-

Author	Title	Price	Date
Bell, David H.	All Four Parts of A Book in The Thirteenth Man: A Novel	\$2.95	09/1982 0941372899
Bennett, James G.	Presidential Power & Money	\$19.95	11/1982 067962613
Borkin, Richard J.	Began And The Economy: The Early Reagan: The Film to Ronald Reagan's Role of A	\$32.95	09/1982 013256812
Brown, Mark	Corpus of the Giant Poetic	\$22.95	1982 091761088
Clinton, Michael	Orations from President	\$21.95	07/1982 043088691
Clinton, Michael	The Triumph of Politician T	\$6.95	10/1982 0294759444
Clinton, Michael	The Complete Ronald Reagan	\$17.95	08/1982 067164925
Clinton, Michael	A Place to Go Back To: A	\$4.95	07/1982 012587621
Clinton, Michael		\$16.95	08/1982 061283130
Clinton, Michael		\$12.50	07/1982 053307196

Within seconds, we were able to pull up a list of all books about Ronald Reagan published since 1982; pressing the Enter key calls up a more complete citation for the book. An optional reviews package makes full reviews available.

PC FACT FILE

Books in Print Plus

Bowker Electronic Publishing
245 W. 17th St.
New York, NY 10011
(800) 323-3288
(212) 337-6992

List Price: \$995 for annual subscription; \$1,395 with reviews. Requires: 512K RAM; two disk drives; a Sony, Philips, or Hitachi CD-ROM drive; DOS 3.1.

In Short: A CD-ROM database containing citations, ordering information, and in some cases critical reviews, for books currently in print. Search software is provided to access the database in a variety of ways, and an order-entry system speeds up acquisitions.

CIRCLE 432 ON READER SERVICE CARD

dents, the four-figure price tag puts it out of their reach. It is, however, a reasonable price for professionals, institutions, and research organizations.

It's also a system that will further whet the appetite of everyone eager to tap into the CD's rich potential.

Fine-tuning Excel: 101 Macros for \$69.95

PC HANDS ON

BY JARED TAYLOR

Microsoft Excel for the PC is only a few months old, but it has already begun to spawn accessories. Macropac International, publisher of macros for *Lotus 1-2-3*, *SuperCalc 4*, *Symphony*, and *WordPerfect*, has released *101 Macros for Excel-PC*, which helps you automate Microsoft's powerful new spreadsheet.

Canned macros of this kind have two purposes: you can use them in your own spreadsheets if they do what you need done, or you can "reverse engineer" them to learn how to write your own macros. This suite of mac-

ros covers enough ground to be useful for both purposes.

Some of the most clearly useful macros swoop through a range of cells and modify them all at once. For example, if you needed to change every number in a range to its cosine, you'd have a job on your hands. With one of these macros, you can apply any legal Excel function automatically to any range.

Other macros remove blank lines or page breaks, put the cursor in various useful places, average the contents of a column, test for values in a range, and swap the contents of one range with another. One macro I tried didn't work; another that was described in the manual wasn't on the disk. A few of the macros

do things you can do more easily from the keyboard, but most are genuinely useful.

Macropac's products are important for what they teach as much as for what they do. Whether or not you actually need a macro in your spreadsheet, it can be edifying to figure out how it works. This collection uses many different commands, and the code comes with explanatory comments. However, the comments are sketchy and sometimes even refer to the wrong lines of code. They are more like reminders to the macro designer than effective instructions for beginners.

Even so, *101 Macros for Excel-PC* is a useful base both for automating your spreadsheets

and for learning how to write macros on your own.

PC FACT FILE

101 Macros for Excel-PC

Macropac International
19855 Stevens Creek Blvd.
Cupertino, CA 95014
(800) 624-0077
(408) 996-8143

List Price: \$69.95
Requires: Microsoft Excel.
In Short: A collection of macros for Microsoft Excel. Not copy protected.

CIRCLE 431 ON READER SERVICE CARD

Paradox: the top-rated relational database manager in the world

Source: Software Digest*		Software Digest Rating	Overall Evaluation	Program Name	Version Tested	Ease of Learning	Ease of Use	Error Handling	Performance	Versatility	Memory Requirement	Price	RATINGS KEY (On a scale of 0 to 10) Overall Evaluation ☆☆☆☆ 9.0 or higher ☆☆☆ 8.0-8.9 ☆☆ 7.0-7.9 ☆ 6.0-6.9 ☆ 5.0-5.9 All Other Ratings ■ 7.0-9.9 ■ 5.0-6.9 ■ UNDER 5.0
☆☆☆☆	8.7	Paradox	1.1	■	■	■	■	■	■	512K	\$495		
☆☆☆☆	8.2	XDB	1.10	■	■	■	■	■	■	320K	\$750		
☆☆	7.6	PowerBase	2.3	■	■	■	■	■	■	384K	\$349		
☆☆	7.0	Open Access II	2.0	■	■	■	■	■	■	256K	\$395		
☆☆	7.0	DataEase	2.5/2	■	■	■	■	■	■	384K	\$600		
☆☆	6.6	dBASE III PLUS	1.1	■	■	■	■	■	■	384K	\$695		
☆☆	6.4	R:BASE System V	1.1	■	■	■	■	■	■	512K	\$700		

RATINGS KEY
(On a scale of 0 to 10)
Overall Evaluation
☆☆☆☆ 9.0 or Higher
☆☆☆☆ 8.0 - 8.9
☆☆☆☆ 7.0 - 7.9
☆☆ 6.0 - 6.9
☆☆ 5.0 - 5.9
All Other Ratings
■ 7.0 - 9.9
■ 6.0 - 6.9
■ UNDER 5.0

Paradox* is once again the top-rated program, with the latest version scoring even higher than last year's top score.** (Software Digest's 1987 Ratings Report is an independent comparative ratings report for selecting IBM PC business software. Ratings Report tests were done by the prestigious National Software Testing Laboratory, Philadelphia, Pennsylvania.)

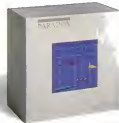
The Ratings Report message is crystal clear: there is no better relational database manager than Paradox. NSTL tested 12 different programs and amongst other results, discovered that Paradox is 3 times faster than dBASE* and 6 times faster than R:BASE* on a two-file join with subtotals test.†

Paradox combines ease of use with power and sophistication

Even if you're a beginner, Paradox is the only relational database manager that you can take out of the box and begin using right away. Because Paradox employs state-of-the-art artificial intelligence technology, it does almost everything for you—except take itself out of the box.

“Paradox 2.0 will do for the LAN what the spreadsheet did for the PC

David Schulman,
Bendix Aerospace ”



PARADOX
by Ansa
A Borland Company

System Requirements for Single User:

- DOS 2.0 or higher
- IBM® PC/XT and PC Compat* PC families and other 100% compatibles
- 512K RAM
- Two disk drives. 2½-inch and 5¼-inch suggested
- Compilation: microcomputers, color or EGA monitor with adapter

*Normalized with permission by Software Digest from its July 1987 Report covering 12 relational database programs.

†Test was designed and executed by NSTL, a 1,000-member and a 10,000-squared test group, at their test site near the 1,000-member and a 10,000-squared test group. The 10,000-squared test was selected using the 1,000-member test results. The test was then repeated and selected in ascending order. The software test was repeated for each group with the results added to a test group. Test results from the test were then compared with the results of the program control were repeated with software.

Special Offer!

We're making a Special Offer on all three versions of Paradox. Mail proof of purchase, dated between Sept. 15, 1987 and Dec. 15, 1987 and your signed registration form for any of the three, and we'll mail you a \$100.00 rebate.** It's that simple!

- Paradox 1.1, suggested retail, \$495.00
- Paradox 2.0, suggested retail, \$725.00 (each copy of Paradox 2.0 supports one user on a network)
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**Rebate request must be received by Borland no later than February 15, 1988, and must include: Proof of purchase, Borland International, 4000 Steele Valley Drive, Santa Clara, CA 95050.

††Within 60 days of purchase the product does not perform in accordance with our claims, call toll-free customer service department, and we will arrange a refund. Paradox is a registered trademark of Ansa Software, Inc. is a Borland International Company. Other trademarks mentioned are registered trademarks of their respective holders. Copyright © 1987 Borland International. ® 1/1/88.



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mainframes and minis through IRMA™ and Smart Alec.™ It works with most popular modems... emulates most popular terminals... and supports the most widely used file transfer protocols.

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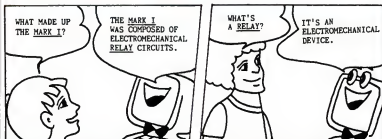
CROSSTALK COMMUNICATIONS/1000 Holcomb Woods Parkway, Roswell, Georgia 30076/(800)241-6393

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COMMUNIQUÉS

edited by Bill Howard



Tomorrow, kids, we'll learn the meaning of the word tautology. Illustration from *Learning About Computers: No Big Deal!*, a 119-page book by Charles T. Shelley from Gauss Educational, San Luis Obispo, Calif.



The one and only: T-shirt from Peter Norton Computing.

Amazing Facts I

"The Macnifier. Projection system that duplicates the Mac's video display in liquid quartz."

—New Products, MacWorld, November 1987

Amazing Facts II

"Now for just \$89.90, you can use your current daisy wheel, dot matrix or ink jet printer to print normal text."

—DAK Industries "Desktop Publishing Breakthrough" ad

Amazing Facts III

"The microchip used in the first IBM PCs and XT's (and various clones thereof) was the 186."

—Syndicated newspaper columnist Peter McWilliams

Full Write Scholars

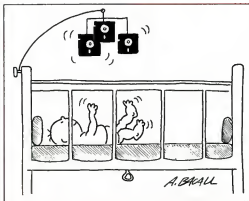
"In 'Introducing 'Dribbleware': The Son of Vaporware' (October 26), we mistakenly referred to Ann Arbor Software as the publisher of Full Write for the Macintosh. Ann Arbor Software publishes Full Write and is not related to Ann Arbor Software, which markets the Textra word processor for the IBM PC family."

—Correction, InfoWorld, November 9, 1987

Lord of the Token Rings

"Our rapidly growing company offers an exciting career opportunity for exper'd professional with knowledge of IBM PC's, XT's, AT's, PS2's & networking IBM Token Ring."

—The New York Times classified ads, November 15, 1987



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FEATURES:

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- 1.2 MB hard disk



Bold advertising from
Commodore, iConti Computer Systems ad,
The Times-Colonist (Victoria, B.C.), November 10, 1987.

If you read, hear, or see something odd about the PC industry, drop us a line. If your item is used in *Communications*, you'll receive \$50 and a PC Magazine T-shirt.

Please: We've seen a lifetime's worth of 4 1/4-inch floppy disks, mouse parts, floppy drives, and Lotus 1, 2, and 3. Remember, *Communications* is supposed to be funny. It's unlikely in the extreme that we'll ever publish home-brewed cartoons created on dot matrix printers, or definitions downloaded from bulletin boards.

If you send a newspaper or magazine clipping, include the name of the publication, date, city of publication if it's a newspaper (there's more than one Journal-Telegram), and your name (print it legibly), address, daytime phone number, and T-shirt size. Please tape your name securely to the envelope and put a mark next to the funny part.

Because of the volume of mail, we can't acknowledge entries. In case of duplicate entries, credit goes to the earliest postmark or (in some cases) the better poemanship. Send your entries to *Communications*, PC Magazine, One Park Avenue, New York, NY 10016, or MC1 Mail 157-9301.

Winners this issue: David Mattison (Commodore an-clone), Edward Mendelson (*Learning About Computers*), Joseph Loughry (liquid quartz), Robert Felix (DAK), David Calloway (XT 186 chip), Fred Chapin (Token Ring).



Stanford 386-18 XXXXXXXXXX **\$2058**

9/18 MHz Zero Wait State 21 MHz Throughput

- Intel 32 Bit 80386 CPU (18 MHz), 9/18 MHz software (keyboard) switchable clock
- Norton SI: 21 (Processor Speed)
- 200 watt P/S, 110/220V selectable
- CMOS memory, 16 channel Interrupt, 7 DMA channels
- 512K interleaved 32 bit RAM on board
- RAM can be expanded to 16 MB of 32 bit high speed interleaved memory
- 2-32 bit, 4-16 bit & 2-8 bit expansion slots
- Supports 80387 math co-processor
- Award BIOS (Phoenix BIOS optional)
- High capacity floppy controller card
- 1.2 MB floppy drive
- Serial port (Com 1), optional 2nd serial port (Com 2), parallel port & (optional) game port
- Hardware Reset and Turbo L.E.O.
- Clock/calendar with battery backup
- Enhanced keyboard (101 keys)
- Complete documentation included
- High quality, heavy duty packaging

Stanford 386-16/1 XXXXXXXXXX **\$1979**

6/16 MHz Zero Wait State 19 MHz Throughput

Same configuration as in System 386-18 except,

- Intel 32 Bit 80386 CPU (16 MHz), 6/16 MHz software (keyboard) switchable clock.
- Norton SI: 18.7 (Processor Speed)

Stanford 386-16/2 XXXXXXXXXX **\$1884**

Same configuration as in System 386-16/1 except includes socket for 80287 math coprocessor.

Stanford 286-12 XXXXXXXXXX **\$999**

6/12 MHz

Same configuration as in System 286-16/1 except,

- 80286-10 CPU, 6/12 MHz Switchable.
- 512KB 100 Nano Seconds, 0 wait state DRAM, installed

Stanford 286-16/1 XXXXXXXXXX **\$1344**

10/16 MHz Zero Wait State 16 MHz Throughput

Same configuration as in System 386-18 except,

- Compact size AT main board
- Intel 80286-12 CPU, 10/16 MHz software (keyboard) switchable clock
- Award BIOS
- 1024KB (one megabyte) 80 Nano Seconds, 0 wait state DRAM, installed
- Selectable between zero wait state (10/16 MHz) or one wait state (8/12 MHz)

Stanford 286-16/2 XXXXXXXXXX **\$1169**

10/12 MHz Zero Wait State 16 MHz Throughput

Same configuration as in System 386-18 except,

- Intel 80286-12 CPU, 10/12 MHz software (keyboard) switchable clock
- AMI BIOS

Stanford 4.77/10 XXXXXXXXXX **\$499**

- 4.77/10 MHz, software switchable M/B
- Phoenix BIOS, Norton SI: 3.3
- 640K 120 N/S ORAM on board
- 360K floppy drive & controller
- AT/XT style keyboard
- AT Jr. case, XT size with AT features

Stanford 4.77/8 XXXXXXXXXX **\$399**

Same configuration as 4.77/10 MHz XT, except,

- XT slide case
- 256K 150 N/S ORAM, Norton SI: 1.7

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- Thomson/Samsung monitors
- 300/1200 /2400 Baud Internal modems
- EGA/VGA/CGA cards
- Optical mouse/Memory expansion cards
- Multi I/O Cards: Serial ports, parallel ports, game port
- IBM 3278/79 terminal emulator cards
- Panasonic printers, fax card, flat-bed scanner
- Plus many, many more...

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\$159⁹⁹

16-bit 2 MB extended or expanded memory per card and up to 4 cards per PC/AT. Software supported: DESQVIEW, Framework, Symphony and Lotus 1-2-3, plus others. Supports speeds of 12 MHz on PC AT. Board comes with O.K.

EEMS RAM Card For XT or AT

\$129⁹⁹

EEMS RAM Card For 386 System

\$239

■ 32-bit 2 MB extended memory card for the 386 AT system board

■ 32-bit 8 MB extended memory card for the 386 AT system board **\$359**

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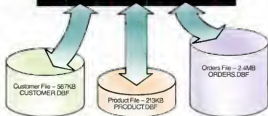
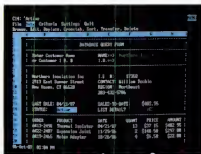


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**BYTE Magazine**

CIRCLE 112 ON READER SERVICE CARD

■ BILL MACHRONE

ONE MILLION PS/2s

IBM has shipped over a million PS/2s. The product line went gold way back in November, amid much hoopla. So is it really a roaring success, or is IBM playing with numbers?



Thanks a million, reads the ad copy. Yes, that's IBM thanking you personally for having bought a million PS/2s. If you had been on the fence, there isn't any reason to be anymore, is there? After all, a million machines in 7 months—Procter & Gamble should do so well with a new toothpaste. So set aside those lingering doubts. Come on in, the water's fine in the PS/2 pool. Everybody's doing it.

Hold on. Before you pitch your PC ATs onto the scrap heap of technology, let's look at the numbers and what they mean.

First off, that's a million shipped, not bought. There's a difference. How big a difference? Maybe a hundred thousand machines. It takes that many just to fill IBM's pipeline. Given the number of dealers, the number of machines, and the number of models, that's a realistic figure.

DOES EUROPE MATTER? So we're down to 900,000. Still not bad. Now we have to figure out whether we care about Europe. PS/2s have been phenomenally successful over there, to the tune of 350,000 machines. Given the size of the market, the natural preference for locally built machines, and that Europe is really one market per country, not just one big market, that's quite an achievement. I'm at a loss to explain it. About the only thing I can think of is that the European market has always been more concerned with design issues. The small footprint, sleek styling, and increased internationalization of these machines, coupled with the IBM cachet, could make them a hit.

I submit, however, that their success in Europe has nothing to do with the U.S. market. Yes, 50 million Frenchmen can't be wrong, but what does that have to do with your decision to buy PS/2s for your company? The Euro market is clearly less hidebound, more experimental than the U.S. market, but you gotta believe that we have a different set of realities, standards, and objectives in choosing our computers. Bottom line: 550,000 U.S. PS/2s.

WHAT'S A PS/2? Now for the tough question. Do we accept IBM's definition of a PS/2? I think not. I'm reminded of the old Abe Lincoln story in which Lincoln asked a crowd how many legs a lamb had if you called the tail a leg. When someone volunteered "five," he said, "No, calling a tail a leg doesn't make it one."

That's how I feel about the Model 30 and the Model 25. What is the essence of PS/2? Micro Channel Architecture? VGA

graphics? 3½-inch drives? Ability to run OS/2? The 25 and 30 score a big one out of four.

Jim Seymour has called the Model 30 (and, by inference, the Model 25) "an intellectually respectable terminal." It's both more and less than that. It's more because it's truly a PC-XT replacement. It's less because anything with less than an 80286 isn't intellectually respectable.

On the one hand, turbo XT's are still the hottest-selling machines, according to many clone builders. One segment of this market will always sacrifice technology for price. IBM wanted a piece of that action. So now it has its own turbo XT clone. On the other hand, you can't build a bridge to the future on obsolete technology. And the 8086 is 10 years old. That's forever in this business.

And yet the XT replacement market is enormous. So big, in fact, that two-thirds of the PS/2s sold are 30s and 25s. Fewer than 200,000 machines in this country are real PS/2s—that is, Micro Channel based. It's still a significant number, but a lot less compelling than one million. And that doesn't address the number of PS/2s in hardware evaluation labs and development slots not involved in end-user computing.

TAKING THE TEMPERATURE

We've been surveying the attitudes of our readers toward the PS/2 since the line was first announced. Surveys in April, May, August, and October last year show rapidly decreasing confusion. Confusion is the enemy of decision making, and people were clearly confused by the new offer-



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VIEWPOINTS**■ BILL MACHRONE**

ings. As confusion diminished, acceptance of the PS/2 line went up. But acceptance (or reacceptance) of compatibles went up nearly twice as fast. People took their understanding of the PS/2 line as permission to start buying compatibles again. The numbers show that they're buying more than ever, too. Some insiders estimate IBM's market share at half of what

■ Compaq has garnered incredible mindshare among high-end system users. Most people I know would rather have a Deskpro 386 than a PS/2 Model 80.

it was last year with the AT and XT.

Meanwhile, our survey had a free-form response area in which respondents could tell us what was on their minds. What was mostly on their minds were Compaq, Zenith, and AST. That shouldn't be surprising, since manufacturers such as these have shown a marked ability to innovate within the supposedly moribund AT specification.

Compaq especially, by staking out the high ground in performance, has garnered incredible mindshare among high-end system users. Most people I know would rather have a Deskpro 386 than a PS/2 Model 80. That must drive the IBMers crazy. IBM takes all the risks, they figure, and everyone else makes the money.

So no matter how you slice PS/2 market share, the battle is ultimately won in mindshare. Tell me if you've heard some MIS-er utter: "Of course! I'll solve this problem by installing PS/2s!" No? I guess that's because PS/2s didn't achieve the uniqueness IBM was striving for, in the mind or in the market.

Oh, and thanks for reading this far. Thanks a million.

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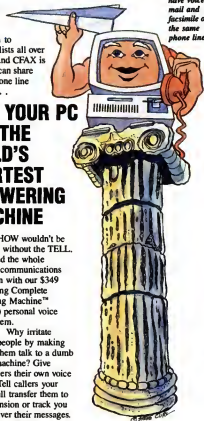
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CIRCLE 176 ON READER SERVICE CARD

■ JOHN C. DVORAK

VIRUS WARS: A SERIOUS WARNING

A new computer virus is infecting microcomputers around the world. Where is the utility that will prevent our PCs from becoming victims in this epidemic?



A computer virus (sometimes called a Trojan horse or a worm) is a small and sinister piece of software code that literally infects your machine. It is inserted into a public-domain or bootleg program and, when the program is used, the virus code is alerted and rewrites itself into something in your system and typically (and eventually) calls a hard disk routine and tells the disk to erase itself. Computer sabotage. It's getting worse and we should all be aware of it. On the West Coast a battle wages where Apple Macintosh users and IBM PC users are loading software with viruses to "attack" their foe: a user of the other kind of machine.

THE LEHIGH VIRUS Meanwhile, one virus has made headlines. It was released at Lehigh University. Here's an excerpt from a memo sent out over UseNet from Kenneth R. van Wyk, User Services Senior Consultant, Lehigh University Computing Center. It describes the virus that was set loose just before Thanksgiving last year and is now floating around the world.

"Last week, some of our student consultants discovered a virus program that's been spreading rapidly throughout Lehigh University. It has the chance of spreading much farther than just our University. We have no idea where the virus started, but some users have told me that other universities have recently had similar problems.

"The virus itself is contained in the stack space of COMMAND.COM. When a PC is booted from an infected disk, all a user need do to spread the virus is to access another disk via TYPE, COPY, DIR, etc.

If the other disk contains COMMAND.COM, the virus code is copied to the other disk. Then, a counter is incremented on the parent. When this counter reaches a value of 4, any and every disk in the PC is erased thoroughly. The boot tracks are nulled, as are the FAT tables, etc. All Norton's horses couldn't put it back together again. This affects both floppy and hard disks. Meanwhile, the four children that were created go on to tell four friends, and then they tell four friends, and so on, and so on.

"Detection: while this virus appears to be very well written, the author did leave behind a couple footprints. First, the write date of the COMMAND.COM changes. Second, if there's a write protect tab on an uninfected disk, you will get a WRITE PROTECT ERROR. So, boot up from a suspected virus'd disk and access a write-protected disk—if an error comes up, then you're sure. Note that the length of COMMAND.COM does not get altered.



"I urge anyone who comes in contact with publicly accessible disks to periodically check their own disks. Also, exercise safe computing—always wear a write protect tab.

"This is not a joke. A large percentage of our public site disks has been gone by this virus in the last couple days."

The mainstream computer magazines seldom discuss these destructive little gags, even though there are plenty of them. PC users must make themselves aware of these things. If a virus program got into a corporation and started eating hard disks, you can be sure that the next time someone brought in some software from home, it would quickly be confiscated. This kind of thing only encourages MIS departments to take total control of the microcomputer installation. Remember, the most talented of the hackers love to design programs like this just to harass the average PC user.

We need some utilities that check the integrity of our computer systems. Of course, these programs would be quickly defeated by some maniac who would find the loophole in the algorithm, and the integrity checker would have to be forever updated. (Sounds like a money-maker!) Some say that the solution to these sick jokes is to perpetually back up the hard disk like a good little boy. Great. I back up my hard disk once a year whether it needs it or not. So what am I (and most users) supposed to do in between times?

All you can do is be careful and know that someone out there is about to make your life miserable if you're not prudent.



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■ JOHN C. DVORAK

INSIDE TRACK

Graphics dazzle, lasers battle, and IBM's best-laid plans take a detour: 1988 starts to roll.

From the looks of it, 1988 will be the year of graphics. The so-called EVGA (Extended VGA) with its 16 million colors and 640 by 480 resolution will be announced, and everyone hopes it will standardize a display device for at least the next 5 years. Until now, the thematic word for IBM displays has been "stopgap." We've seen the monochrome, the Hercules, the CGA, the EGA, and now we see the VGA and the EVGA—not to mention the Targa, the Vista, the cards from Number Nine, and a host of others made by Paradise and Video 7 and who-knows-who. It's ridiculous.

A 640 by 480 card with lots of colors, the ability to handle full motion video, and genlock (the ability to intermix an NTSC full motion video image with a computer image) will do fine, thank you. One chip set, dubbed the RXC01, with the ability to do the above plus digital distortion, 3-D manipulation, and other feats, is being looked at "by the thousands" at IBM. Let's hope they take this seriously. I am sick of being shown up by kids with an Amiga!

The Never-Ending Saga of the Model 90. In our last episode, the scientists were readying the IBM Model 90 supermicro containing a fast 80386 chip and the newest version of the 801 RISC chip, dubbed "the newest version of the 801 risk chip." Oh-oh! Some evil soul, Simon Legree, has fouled things up. The thing doesn't work. Hence a Model 85?

Music, maestro. Cut to the scene with the girl strapped to a log headed toward the buzz saw. She's a model. They're trying to kill her—no more models? Could it be a marketing battle? IBM now wants to reestablish the "system" moniker for its high-end micros. **System 39** as

Dvorak predicted? No, no, says Deep Blue. System A, System B, System XYZ, says Deep Blue. System 3X, as Dvorak predicted. Deep Blue takes a deep breath. "How should I know? I just work here." To be continued. . . .

Hellooooo, Panasonic Dept.: As I mentioned many months ago, Panasonic has its sights on the laser printer market. Recent intelligence says that it sees Canon as faltering and the 15 other engine makers and would-be makers as lost scramblers without direction. Panasonic (a.k.a. Matsushita) sees the market divided into six segments, which it thinks it can attack in force with a slew of machines from low-end to **high-end screamer**. Word has it that Panasonic has even developed a **2,000-by-2,000-dot** engine just to show off its prowess.

While we laugh at this maker of VCRs and TVs and unimportant microcomputers, we have to see what it's done in markets that it takes seriously (including VCRs, stereo gear, and TVs). One example is the telephone business. Panasonic has raised holy havoc in the phone market with its inexpensive PBXs and key-switch phone systems for small businesses and homes. We're not talking about the phone answering-machine, portable phone, or kitchen phone markets (which it also dominates).

For \$1,000 or so you can get an **incredible PBX** system for your home or office. I recently received a press release for some of the new additions to the Panasonic line of "serious" phones, like a 12-line phone for the guy who has everything. Give me a break. Best keep your eyes on this company.

So I'd expect a virtual **World War III** with laser printers this year (finally!). Some observers say they won't be sur-

prised if someone is selling one for \$500 by November Comdex.

Genuinely Interesting Software Dept.: If you're looking for an interesting (and cheap) accounting package for home or for a small office, look no further than Parsons Technology and its \$16 package called **Money Counts**. I discovered this in the back of *PC Magazine*; it's worth a look. The best part is that Parsons himself seems like he's always at the phone to answer any questions about the package. Call him at (319) 373-0224 to order a copy. I was impressed. It wins the cost-effective award.

The other accounting package that passed my way comes from Dac, and it's new **Dac Easy Light**—an inclusive \$69.95 general ledger, check writer, and bill tracker. Dac Software in Dallas has been selling a full-feature system for years at a low-ball price. Recently they sent me a press announcement in a sealed salted nuts container. I've heard of canned press releases, but this is ridiculous. Call them at (214) 458-0038.

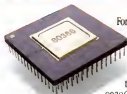
Tales from the Crypt Dept.: Techie editor Robert Hummel had his wife make a prototype T-shirt that says: **OS/2, Just Say No!** The OS/2 is enclosed by a circle and slash (get it?). I used this prop in a recent talk and got howls. I encouraged Rob to grind out a few hundred copies, which he is selling for \$10 each. (To order, send cash or money order to Robert Hummel, P.O. Box 1936, Murray Hill Station, New York, NY 10156.)

With whom do you think this shirt is popular? The boys at **Microsoft**, that's who. Great kidders, all. Soon a shirt ends up in an executive's office—where it is spied by **Bill Gates**, who has seen more than a few of the things. He looks at it and asks, "Should I be concerned about this?" The VP looks over his shoulder and says, "No way!" Gates is relieved and wanders away.

I'd **think twice** about being concerned.



APPEAL TO A HIGHER



For sheer power in a personal computer, the magic number is 386. And if you're looking for the best value in a 80386-based system, the number is 1100.

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■ JIM SEYMOUR

AND DIFFICULTY IS PRESERVED

Since applications running under OS/2 no longer have to work within the constraints of the 640K RAM barrier, they should be faster and easier to use. But will they be?



I have this uncomfortable feeling that you and I are about to get sandbagged. Again. By some of those swell folks in the PC software business.

For about 300 years now, it's been an article of faith that one of the things standing in the way of making programs faster-running, and easier to learn and use, was the infamous DOS 640K RAM barrier. With so little memory available for DOS and our application—to say nothing of a few pop-up TSRs—programmers just didn't have enough space to write that famous "smart code" that would make programs wonderfully simple to use. And fast.

But someday—someday!—we'd be able to break through that terrible 640K barrier and get at more memory. When that happens, wow! Just stand back and watch programs get easier to use, mister. Because once programmers find it permissible to write programs that take maybe a megabyte of memory, they'll finally have enough room to put in all those clever things they know how to do to make those programs so much easier to use.

And faster.

Uh-huh.

Well, let me give you the bad news. I've been traveling around the computer industry for the last few months, looking at early versions of OS/2 applications. You remember OS/2: access to 16MB or more of RAM, no more 640K nonsense, the operating system of the future, the soul of the new machines, etc., etc.

So these new OS/2 applications are going to be just wonderfully simple to use,

huh? Because programmers understand our desire for faster, easier-to-use programs and aren't going to squander all that memory on just making programs bigger and maybe more powerful? And remember, the multitasking possibilities of OS/2 will go that much further toward making these programs so much easier to use? And faster?

Uh-huh. Sure.

You won't believe some of the sludge I've seen. Even the programmers can't remember how to run it.

If you were at Comdex in November, you got a little preview of some of these babies. If you weren't, don't worry: you'd have wept.

Friends, they sure aren't devoting all that memory space to making 'em easier to use. Or faster. Yet. And maybe never, to judge from what I've seen and heard.

In fairness: These are very early copies. And most of what I've seen, in public and

behind closed doors, are programs brought over from the world of DOS, not new programs designed from the ground up for OS/2.

And since OS/2, Version 1, is really more of a programmer's plaything, a tool for learning about OS/2, the "good stuff" is really going to come along with OS/2, Version 1.1, late this year and next, with the Windows-like Presentation Manager graphical interface. Which, if used well, ought to go a good deal of the way all by itself toward making application programs easier to use.

I believe that. I really do. Well, I want to believe that. . . .

My colleague Robert Hummel, a techie to the core and one of the keepers of the technological flame here at *PC Magazine*, has expressed his dismay over the directions OS/2 is taking, and how its resources are being used by the people who tell jokes in hexadecimal, in a hilarious set of principles he modestly calls *Hummel's Laws of Conservation of Mass and Difficulty*. They deserve to be known more widely, and so I quote, with his permission:

LAW I: The difficulty of using a program is proportional to its usefulness, inversely proportional to the speed, size, and ease of learning, and is a constant.

Corollaries

1. Any application program that is fast enough to be usable will be too difficult for the average user to learn.
2. Any application that is small enough to run comfortably on the average system will lack essential features.



■ JIM SEYMOUR

- Any application that is easy to learn will be too slow for the average user.
- Any application that has all essential features will be too slow, too big, and impossible to learn.

LAW II: When multitasking applications on a personal computer, difficulty is conferred and is a constant.

Corollaries

- A machine capable of running a multi-

tasking OS will run a single application fast enough that multitasking becomes unnecessary.

- An application that requires such a large execution time that an increase in productivity would result from multitasking will take even longer to run under a multitasking OS, effectively negating any gains. Difficulty is preserved.

- Multitasking will not make exchanging diskettes of different sizes any easier.

LAW III: Creativity is inversely proportional to the available memory size of a computer.

Corollaries

- Fast, fat computers breed slow, lazy programmers.

■ Most of what I've seen are programs brought over from DOS, not new programs designed from the ground up for OS/2.

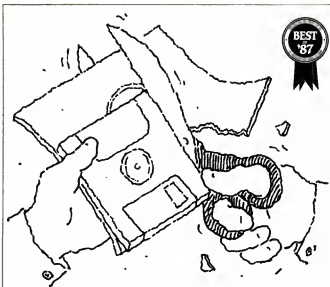
- Slow, lazy programmers write large, slow, difficult-to-learn programs that need faster, smarter operating systems to be usable.

- As programs get larger, add more features, and require more memory, and computers get faster, smarter, and provide more memory, the probability of assembling a personal computer system for a reasonable price approaches zero . . . and difficulty is preserved.

Amen, brother.

Look, I don't want to be a meanie. I have my official Microsoft OS/2 Developer's Kit, and OS/2 on my AT, and I'm game.

But please, developers, deliver on some of those old promises before making any new ones. Like making things run faster, not slower. And making them easier—not more difficult—to use.



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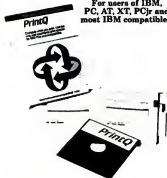
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■ STEPHEN MANES

SON OF FRITTER: TIME WASTING MARCHES ON



Computers have always been masterful at wasting users' time. Now new advances help make it simple, effortless, and fun to squander more hours than ever!

[Manes's historic scoop on the computer feature most responsible for frustration, anger, and marital disharmony originally appeared in PC Magazine, February 25, 1986, "Fritter" has since entered computerdom's vocabulary as an everyday term of opprobrium and rue.—Ed.]

Got a few minutes to kill? Great! It's the gala second anniversary of my ground-breaking discovery of "fritter"—time fruitlessly wasted in the attempt to make computer hardware and software do what they're supposed to. Because fritter has grown more sophisticated and pervasive, I'm celebrating with an up-to-the-minute look at fritter technology.

For a capsule history of fritter evolution, just take a gander at the development of the Apple Macintosh. It used to be simple. You couldn't easily poke around in its hardware or software innards, so originally its fritter came mostly from miserably inadequate manuals. But users' attempts to add non-Apple peripherals and complicated, buggy software brought the Mac into the fritter big leagues. Today the Mac SE and Mac II with slots and options may well be destined to generate fritter on a scale heretofore seen only in the IBM PC environment.

The Mac's fritter gains, however, are unlikely to win preeminence in the field. PC fritter technology has progressed so fast that Armonk, New York, will hold a down-home harvesttime Fritterfest next year in celebration.

Take printers: With the original Mac, you could use any one you wanted, as long

as it said Apple on the label. Though that MacRule is changing, it's still light-years away from our IBM world, where anything goes and printer-code fritter runs rampant.

And PC-printer-fritter specialists haven't sat on their laurels. They've fired back, as usual, with the multiple-standard method of fritter development. May we interest you in HP LaserJet codes? PostScript? Some not-quite-emulating clone? Something else entirely, sir or madam?

Now young and old alike can squander hours attempting to get an amazing variety of fonts to resemble real type. After frittering away dozens of hours with a word processor or desktop publishing package, they often hand the whole thing to an art director who can cut through the chaff—precisely as they did in the days before computers made layout "easy."

Display fritter? We've got it! Every couple of years, IBM introduces a higher-res-

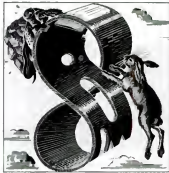
olution mode that makes older monitors obsolescent. Which resolutions work with the software you're trying to run? Will on-screen fonts even vaguely reflect the ones you'll see from your printer? Will your "fully compatible" card duplicate all the hardware-level registers and undocumented bugs? It could take days to find out!

Incompatibility fritter abounds, even among IBM machines. Keyboard fritter would take a whole column to explore. Manual fritter would take a book. Alas, the PS/2 line does away with switch fritter; its installation fritter helps compensate for the loss.

NEW DISCOVERY Until lately most fritter seemed incidental to the product. Now my esteemed colleague Ed Mendelson has revealed an important fritter development. Mendelson recently discovered the existence of what shall henceforth be known as "fritterware": software *deliberately intended* to help you waste time.

Don't confuse fritterware with entertainment software, which generally has some sort of recreational purpose. Fritterware encourages mindless dissipation without any payoff whatsoever—except, of course, the avoidance of productive work.

Obsessive data manipulation is crucial to fritterware, so most software has fritterware elements. Spreadsheets, for example, quickly rose to the top of the fritterware pile for their ability to squander the user's hours producing tables, charts, and graphs that have endless variety but no value whatsoever.



■ STEPHEN MANES

Databases are double-whammy fritterware. Since data entry is incredibly time-consuming, users can while away days at a time logging information. Then they can beguile the hours fiddling with the facts.

Professor Mendelson reports that academics are particularly fond of spending weeks entering notes and then dissipating months examining them with text-retrieval software, which often adds the fritter la-

gnappe of delays for indexing. Fritterware thus helps the pedant postpone almost indefinitely the onerous chore of dissertation writing.

PURE AND ELEGANT However, pure fritterware is a more recent development. The earliest form generally cited in fritter literature is "thought-processing" software. Spend hours entering your outline. Tinker for days, collapsing and expanding it. Fritter, pure and elegant.

Lotus has made the most significant new contribution to IBM PC fritterware. Its new *Agenda* includes difficult file importation (therefore virtually demanding time-wasting data entry) and an awesome range of varieties of data manipulation. Whether its standalone nature is a fritter advance compared with, say, TSR client-tracking programs remains unclear. Although you're less tempted to waste time with a non-TSR program while you're doing real work, you're likely to stick with standalone fritterware once you've got it running. Research on this is currently under way at the Manes Fritter Institute.

Apple has its own new fritterware contribution. *Hypercard* lets you click and monkey around with screen-sized snippets of information. A complete programming language helps fritter countless hours in pursuit of perfect "stackware." Is this cool, or what?

Other exciting developments include CD-ROM fritterware (gee, with this on-disk encyclopedia the gross national product of Botswana is at my fingertips!), windowing environments (watch: with just a single keystroke I can paste my Bible concordance into my general ledger!); and of course, OS/2 (keep your eye on the stopwatch—that 12-meg spreadsheet is recalculating in the background with only a 40 percent decrease in speed!).

The future looks bright. Fault-tolerant fritterware will keep you wasting time even when you accidentally try to work. Artificially intelligent fritterware will help you waste time according to predefined rules. And a big advance is coming from the land where productivity actually means something: multitasking fritter simulation software from Japan lets you pretend to waste time while actually doing real work.

It probably won't go over big here. ☐

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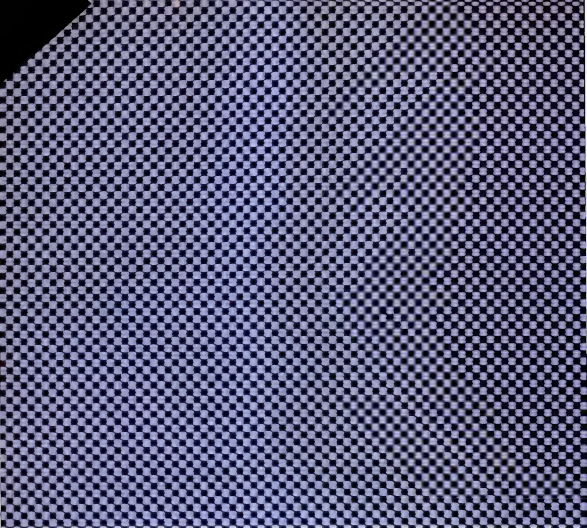
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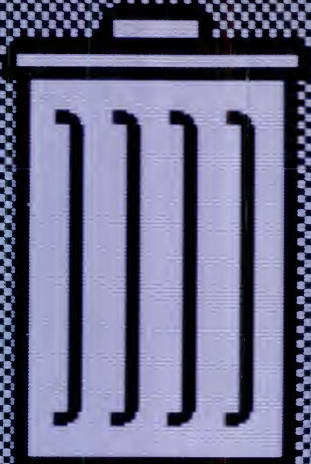
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What a difference 2 years make!

We last undertook a major evaluation of word processing software 2 years ago, in the January 28, 1986, issue. As John Dickinson (then Special Projects Editor, now the Director of PC Labs) wrote in the introduction to that story, "The number and variety of products designed to fulfill this incredibly wide range of needs has made word processing the most competitive market in PC software. As a result, no one product dominates that market the way Lotus Development Corp.'s 1-2-3 holds sway in spreadsheets or Ashton-Tate's dBASE

product line dominates database management."

Today, the number of PC-WP products available has grown even larger: you'll find 55 in this issue, covered in even more detail and put through more rigorous workouts than the 57 we looked at 2 years ago. And you can look forward to still more, as our coverage extends to scientific and integrated WP packages in our future issues.

Even as the number of competitors has increased, we've seen something of a shakeout in market share. That's not exactly how Harvard Business School teaches that markets work, but then the PC



As the quality of word processors improves, distinctions between professional, corporate, and personal programs have blurred. Some of the best programs seamlessly integrate text, graphics, and 1-2-3 worksheets in a merger of word processing and desktop publishing. Others offer robust features geared to professionals—lawyers, scientists, academics.

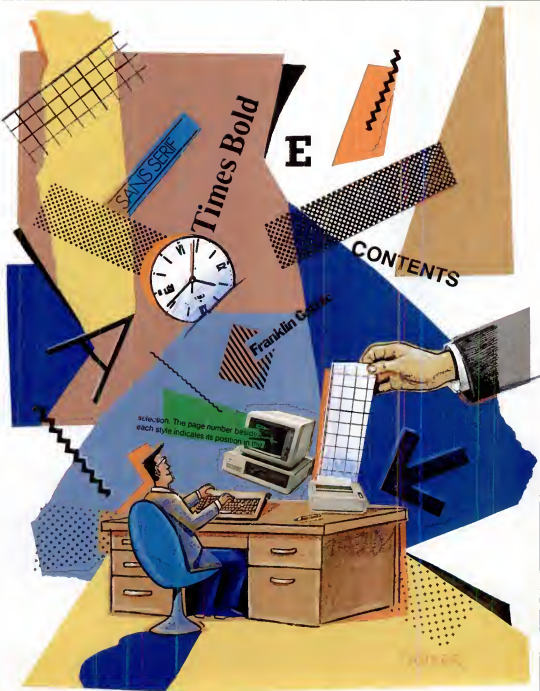


Illustration: Peter Kuper

■ WORD PROCESSORS

business has rarely followed the rules of the game. The word processing market is still far more fragmented than the spreadsheet and database software markets. But today two products—*WordPerfect* and *Microsoft Word*—dominate the serious word processing software business even if their collective dominance isn't so strong as the holds *1-2-3* and *dBASE* have in their markets.

A TWO-HORSE RACE A look at how this competition has developed sheds light on much of what has happened in the PC-WP world over the last 2 years, and points to the ways other products—and the market itself—will likely change over the next year or two.

A lot has happened even since 1983, when word processing began to get serious. Certainly, programs are packing more features for the price. Once upon a time, when *WordStar* was the standard in American offices, its mail-merge and spelling checker came at an additional cost. Today its vendor, MicroPro, like legions of others, offers these features as part of the standard package.

The zigzag race between *Word* and *WordPerfect* to add features and cut prices has been fun to watch. One of them adds a feature or two or ten in a new release; the other responds almost immediately with the announcement of another new release coming soon, incorporating those features and more. The first then follows up that release with an announcement of yet another new release with a half-dozen new features. When that one ships. . . .

Microsoft has won the number-of-releases game, with more new versions at more frequent intervals; but *WordPerfect* has done very well in earning customer loyalty while actually increasing market share slowly.

Microsoft has also increased market share—by taking chunks of business away from other vendors formerly well entrenched in the market. But *WordPerfect* remains comfortably ahead in the market-share game, though *Word* has been closing the gap since early 1987. IBM's *DisplayWrite 4.0* and Ashton-Tate's *MultiMate* are next in line, well behind the leaders.

PC Magazine readers told us of their word processing habits and preferences in

a recent poll on our Interactive Reader Service (see sidebar, "The Write Stuff"). Their replies indicated that about 27 percent are using *WordPerfect*, 19 percent are using one of the *WordStar* editions, 11 percent are using *Microsoft Word*, and there are still strong preferences for *MultiMate*, the shareware product *PC-Write*, and *DisplayWrite*.

Both *Word* and *WordPerfect* have now grown into complex, richly featured programs—much better than any of the dedicated word processing systems of years

*Word and WordPerfect
have grown into complex,
richly featured programs
much better than any of
the dedicated word
processing systems of
years gone by.*

gone by. Both have far more features than any single user is likely ever to use—or even to understand. But precisely because both offer such long laundry lists of features, they can serve many kinds of users well: if you can't find what you want in one or another (and increasingly, in both), you have some very special needs indeed.

PRICING PRESSURE That intense, head-to-head competition has also kept prices down to much less than either product would bring in a less competitive market. The current versions of *Word* at \$450 and *WordPerfect* at \$495 have high list prices, but street prices for *WordPerfect*, Version 4.2, have been advertised as low as \$180, and as low as \$195 for Version 4.0 of *Microsoft Word*. That's an extraordinarily low price for products so complex. Both are more difficult to code and more difficult to keep upgrading than, say, spreadsheet and database products selling at those same outlets at prices from half again to more than twice as much.

The low prices are also remarkable in

light of the continuing free telephone support provided by both vendors—at a time when other major software publishers are either charging outright for all phone support or creating two-tiered support systems of fast, responsive service for those willing to pay, and slower, good-luck-on-hold support for those who think that service should be included in the product price.

Microsoft upped the ante considerably when Version 4.0 of *Word* shipped last fall. With macros, easier-to-use style sheets, a form-fill option, line-draw modes (including boxes around proportionally spaced type), automatic "hot links" to most spreadsheets, and dozens of other new or improved features, *Word* 4.0 became the richest-featured word processing program available for PCs.

At Fall Comdex, just a month later, *WordPerfect* roared back with previews of WP, Version 5.0, due out shortly after you read these words. This new *WordPerfect* makes the trick of enfolding graphics into text documents, which has been one of *WordPerfect*'s strong suits, even easier and adds a limited capability to manipulate those graphics. It can even display graphics such as pie and bar charts in color—as assuming they were created in color, of course. (That begs the question of how users will get those colors onto paper, given the paucity of good text-and-graphics color-output devices. Still. . . .)

The new *WordPerfect* also adds the ability to mix different font sizes in midline (long a strength of *Microsoft Word*), and more WYSIWYGness.

WHAT I SEE YOU GET The problem of WYSIWYG (for "What You See Is What You Get") representation of documents as they are being prepared has long dogged the IBM PC-WP world. While many vendors claim their software offers true WYSIWYG displays, none yet delivers it on IBM PCs and compatibles. While up-to-date PC-WP products can show line breaks properly and *Word* can use a graphics mode to represent bold, italic, small-cap, and other type style variations, no mainstream PC word processor yet shows different typefaces and type sizes on-screen.

The one exception—and it's hardly a mainstream, general-purpose tool—is

OUR REVIEWERS

E. Atkinson works in marketing and sales in the New York area and writes about information systems, travel, and the entertainment industry.

Robert Ausura is a Washington, D.C., writer who specializes in scripts for businesses, associations, and the entertainment industry.

Marcelline A. Barron is the Computer Education Supervisor for the Cincinnati Public Schools.

Claude Bartel is a principal of Bartel Associates, a financial/microcomputer consulting firm based in Westport, Connecticut.

Frank Bican is a departmental computer resources supervisor at a Cleveland medical center.

Bruce Brown is a principal with Soft Industries, a microcomputer consulting firm based in Southington, Connecticut, and a contributor to *PC Magazine*.

Michael L. Brown is a principal of Weinberg & Wilfong, Certified Public Accountants, and vice president of Management by Micro—both in Rockville, Maryland.

Susan Davis is vice president of the Stemp Group, a New York consulting firm specializing in accounting software. **Carol Olsen Day** is a frequent contributor to *PC Magazine*.

Charles Dervarics is a free-lance writer in Washington, D.C., specializing in education and technology.

John DiMenna is president of Software Seller, a software and hardware consulting company in Westchester County, New York.

Carol Ellison is an associate editor of *PC Magazine*.

Craig Ellison is a consultant specializing in the design and manufacture of computerized toys.

Kate Emery is a computer consultant with Soft Industries, a microcomputer consulting firm based in Southington, Connecticut.

Mike Falkner is a microcomputer consultant based in Sacramento, California.

Robert W. Fay is an engineer and man-

ufacturing executive in Minneapolis, Minnesota.

Henry Fersko-Weiss is a free-lance writer based in Warwick, New York.

Michael Friedlander is a consultant in accounting and administrative software in Westchester County, New York.

Posy Gering is an editorial consultant to *PC Magazine*.

Caroline Halliday is an electrical engineering consultant with High Tech Aid in Ellicott City, Maryland.

Wayne Harding is president of an accounting firm in Denver, Colorado, that specializes in microcomputer applications for business.

Sylvia Helm is a New York-based free-lance writer and an associate editor of *Computers in Banking*; she also teaches writing at New York University.

David L. Hoffman is a microcomputer consultant and vice president of the New York Personal Computer Users' Group.

Judy Housman is a microcomputer trainer and consultant based in Cambridge, Massachusetts. She directs the Boston Computer Society's Training and Documentation Group.

Tamara Johnson is a computer consultant for Pisenti & Brinker, an accounting firm in Santa Rosa, California.

Howard A. Karten is a longtime industry observer and consultant in Randolph, Massachusetts.

Rob Kendall is a free-lance writer and editor based in Rahway, New Jersey.

Claire Kincaid is president of Editorial Experts, a full-service publications firm in Alexandria, Virginia.

Barbara Krasnoff is a free-lance writer based in New York City, and a frequent contributor to *PC Magazine*.

Leo Lefkowitz is an independent business systems consultant in Houston, Texas. He is also president of the Houston chapter of the Independent Computer Consultants Association.

Edward Mendelson is a contributing editor of *PC Magazine* and a professor of English at Columbia University.

Marianne L. Meyers is an accounting

services consultant in Lawrenceville, New Jersey; she previously worked for the accounting firm of Ernst & Whinney. **Catherine D. Miller** is an associate technical editor of *PC Magazine*.

Patrick Nicholas is a free-lance writer based in New York City.

Jeffrey K. Parker is a wire service reporter in New York City.

Alfred Poor is a consultant with Soft Industries, a microcomputer consulting firm based in Southington, Connecticut.

Rubin Rabinovitz is professor of English at the University of Colorado at Boulder and the author of *Samna Luxury Word Processing* (Tab Books).

Robin Raskin is a New York-based free-lance author, editor, and consultant, specializing in computers, and a frequent contributor to *PC Magazine*.

Philip F. H. Rose is a project leader for PC Labs.

John O. Schoenbeck lives and writes in Cleveland, Ohio.

Gene Smilgiewicz is president of UBM, a New York firm specializing in database and network applications.

Stephanie Stallings is a programmer and a former associate editor of *PC Magazine*.

Morris W. Stemp is president of The Stemp Group, a New York firm specializing in accounting software.

William H. Stewart is a principal with the accounting firm of Price & Paige in Clovis, California.

M. David Stone is a New York-based science writer and a contributing editor of *PC Magazine*.

Donald B. Trivette is the author of *A Quick & Easy Guide to Dow Jones News/Retrieval* (Compute! Books).

Kenneth H. Werner is the founder and owner of a Houston, Texas, information firm specializing in human factors and audits.

Gregory Scott Wilfong is vice president of Management by Micro and president of Weinberg & Wilfong, an accounting firm—both based in Rockville, Maryland.

■ WORD PROCESSORS



The Trek from Typewriters

In the beginning, there were typewriters . . .

And then there were super typewriters. In July 1961, IBM introduced its Selectric typewriter, a fast electric model with changeable print balls that gave users more control over the typeface and type size in their documents.

Ten years later Wang Labs introduced its Wang 1200, a small-screen typing workstation that read the user's output and stored up to 133,000 characters on cassette tape. The 1200 had telecommunications and simple formatting capabilities and allowed users to recall and edit their documents. Five years after that, Wang developed and expanded the concept with a disk storage system capable of storing up to 4,000 pages: the WPS (Word Processing System).

Meanwhile, personal computers began appearing in 1975 with the introduction of the Altair, but it was not until September 1976, when Digital Research Corp. introduced the CP/M (Computer Program Management) operating system, that disks became a viable storage medium on PCs. And in June 1979, Seymour Rubenstein, founder of MicroPro International, introduced *WordStar* for CP/M.

At the time, Alan Ashton and Bruce Bastian, two programmers in Orem, Utah, were working to develop a word processing program for the town government. In January 1980, they founded WordPerfect Corp. and introduced *WordPerfect* for the Data General minicomputer.

Dedicated word-processing systems continued to dominate the corporate office market, however. Within an 18-month period in 1980 and 1981, IBM and Wang introduced competing systems—the IBM Displaywriter System appearing in June 1980, and the WangWriter in December 1981.

Then in August 1981, IBM introduced its personal computer, the IBM PC. At the same time, Information Unlimited Software announced the first piece of software to run on the new machine, a word processing program called *EasyWriter*.

In fact, 4 months earlier Camillo Wilson, president of Lifetree Software, had unveiled a word processing program called *Volkswriter*, purported to be able to run on IBM's soon-to-be-released machine. Lifetree began shipping a 64K version of *Volkswriter* for the PC that September.

At the time, however, serious word processing continued to be done on dedicated systems, minis, and CP/M machines. Many users, reluctant to sacrifice the applications they were running in CP/M, retrofitted their PCs

July 1982, the product we now know as *MultiMate* was released as *WordMate*. In December of that year, WordPerfect Corp. ported its program from the DG mini to the PC.

But these programs still had the look and feel of their non-PC parents. In April 1983, MicroPro brought serious word processing to the PC with its release of *WordStar*, Version 3.3, a PC word processing program that quickly captured the corporate market with its features and speed.

One month later *PFS:Write* emerged as the first personal word-processing program to take advantage of the PC's unique qualities, letting the user see the "page" on-screen more or less as it would appear in its printed version—with margins, line spacing, and headers and footers displayed.

Hardware



Software

* For the Apple Macintosh

with a "Baby Blue" card, which made it possible for users to run CP/M programs on the PC.

But vendors were busy porting their applications over to the PC. In June 1982, MicroPro released *WordStar*, Version 2.3, for the PC. A life insurance company, Connecticut Mutual, commissioned a group of programmers to port the Wang word processing system to the PC, and in

That year, Microsoft Corp. extended the What-You-See-Is-What-You-Get (WYSIWYG) concept with its release of *Microsoft Word*. *Word* operated in graphics mode and displayed a formatted page—complete with graphics. In place of a highlight, users saw bold as bold and italic as italic.

IBM and Apple, in 1984, both introduced faster and more-powerful

PCs: the PC AT and the Macintosh Apple; and Hewlett-Packard introduced desktop laser printers for personal computers with the release of the Apple LaserWriter and LaserJet. That year, too, IBM brought its Displaywriter editor to the PC with the release of the *DisplayWrite Series*.

One year later, Wang brought its editor to the IBM PC with its release of *Wang WP* for the IBM PC. At the same time, desktop publishing programs began to appear for the Mac, but *PageMaker*, released for the Mac in 1985, did not come to the PC until 1986.

On April 2, 1987, IBM introduced its Personal System/2, and today the word processing market is in a position somewhat similar to what it was in 1981 when the PC was intro-

duced. Unlike the PC in 1981, the PS/2 machines can run the present generation of software. More and more, word processing programs are encroaching on the low end of the desktop publishing market. Among the major new products with a desktop publishing interface are *WordPerfect*, Version 5.0, Digital Research's *First Word Plus*, and Lifetree Software's *Total Word*. —Carol Ellison

Windows Write, the word processor included free in all versions of the operating environment, *Microsoft Windows*. It's a great memo writer, and if it's installed properly for your printer (and if your printer is capable of producing the faces) it does display a limited range of Times Roman, Helvetica, and Courier typefaces on-screen. But few are likely to use *Windows Write* as a full-fledged word processor, despite its ease of use and intelligent, *Microsoft Word*-like approach to WP.

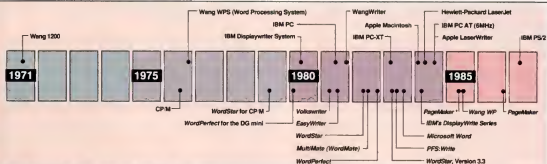
Meanwhile, Apple's Macintosh boasts several word processors (and, for that matter, database, spreadsheet, communications, and graphics programs) that show true WYSIWYG on-screen. IBM and a huge cast of third-party vendors have taken heroic steps to overcome the PC's original character-oriented mindset, but if WYSIWYG is important for you, PC products are still unsatisfying.

There is a good argument to be made that WYSIWYG is not only unnecessary but actually intrusive and inappropriate in word processing. For those grinding out

able—and how much more quickly noticed, read, and acted upon—those same letters and proposals and reports are when prepared on a system that allows easy changes of type size and type font, and incorporation of graphics.

YOU ASKED FOR IT Just as *Microsoft Word* and *WordPerfect* illustrate, in their cobra-and-mongoose duel, the frenzy to get more features into today's PC-WP products, both show the trends beginning to appear in many other WP programs. More speed and greater ease of learning and use are customers' two big demands; Microsoft and WordPerfect have been tuning their products to respond.

For its last several versions *Word* has had a superior disk-based tutorial, *Learning Word*. After its initial use for a guided tour and general lessons, *Learning Word* remains useful, because users can call it up from within *Word* for a quick, highly specific on-line lesson when they use a feature new to them or only rarely employed. *WordPerfect* has good documentation,



duced. Unlike the PC in 1981, the PS/2 machines can run the present generation of software. More and more, word processing programs are encroaching on the low end of the desktop publishing market. Among the major new products with a desktop publishing interface are *WordPerfect*, Version 5.0, Digital Research's *First Word Plus*, and Lifetree Software's *Total Word*. —Carol Ellison

stacks of correspondence, reports, manuscripts, proposals, and other ordinary-looking text-only documents, paying the cost of WYSIWYG in terms of more-expensive hardware and slower operation (due to the overhead involved in drawing and redrawing graphics versus text-only screens) may be a waste.

That argument fails, though, when you see how easy it is with a true WYSIWYG product to envision exactly where on a page text will fall. And it absolutely collapses when you see how much more read-

able—and how much more quickly noticed, read, and acted upon—those same letters and proposals and reports are when prepared on a system that allows easy changes of type size and type font, and incorporation of graphics.

Advantage: *Word*.

But thanks to its size, graphics orientation, and general sluggishness, *Word* has been a tortoise to *WordPerfect*'s hare in speed comparisons. *XyWrite* remains the fastest WP program around, but *WordPerfect* has long been amply quick and nimble for almost any work. *Word* has a richly deserved reputation for taking too long to load files, save them, move the cursor—and even backspace over an error.

A Number of Reasons A Number

1. Designed for the 80386

There's a revolution taking place in desktop computing. A revolution that's been launched by a square wafer of silicon known as the 80386 microprocessor chip. It puts minicomputer potential at PC users' fingertips. It's a fact that virtually every leading PC manufacturer has built a "box" around this chip. And it's a fact that the "New Operating System" will, supposedly, even run on it. But, it's also a fact that *their* system wasn't designed for the 80386. Ours is. And it's called PC-MOS/386™



2. PC and PS/2 Compatible

In designing PC-MOS, we knew our first priority was to exploit the minicomputer capabilities of 80386-based PCs & PS/2s. But we went further, and developed a system which would be fully existing PCs, PC ATs, and sacrifice. You'd expect

compatible with the millions of PC-compatibles. Power without nothing less from the new standard bearer.



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From the beginning, PC-MOS/386™ was designed as a versatile operating system which could support twenty-five users as easily as it supports one. The system comes in single, five, and 25-user modules, so you're able to start with what you need and expand when you're ready.

In a multi-user setting, PC-MOS/386™ uses the computing power of the host PC to drive workstations linked to standard RS-232 ports.



4. Thousands of DOS Programs PC-MOS/386™ gives you the best of the past, and the best for your future. Which means that while PC-MOS/386™ totally replaces your old DOS, you won't have to replace the programs you've spent a lot of time learning.

And it all happens so effortlessly. You'll continue to reap the benefits of your favorite DOS programs, while entering a new arena of power.

Think of it! Programs like dBASE III, WordPerfect, Lotus 1-2-3 and Symphony, WordStar, MultiMate...literally thousands of DOS programs—all compatible and multi-user available.



5. Familiar Commands Like DIR and COPY

Just as you don't have to learn a whole new array of software to take advantage of PC-MOS/386™, neither do you have to learn an entirely new set of commands.

Instead, the system builds on the knowledge you already have. "COPY" still copies files, and "DIR" still gives you a directory listing. As you might expect, we didn't stop there. There's a wealth of features that have strengthened the commands you know, making them more powerful and easier to use.



You can choose from a variety of workstations. Mix and match dumb terminals costing under \$500 each with PCs and PS/2s running our terminal emulation software.

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7. Multi-Tasking

While it's true you could look elsewhere for multi-tasking, why would you want to? The other multi-tasking operating system is not now, nor is it planned to be, multi-user. It won't even run multiple DOS applications in multi-tasking mode.

Now consider PC-MOS/386™. At the touch of a key, you can switch between up to 25 different tasks. And if you have workstations connected to a host, they get multi-tasking, too. Finally...a system that won't hold you back.



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PC-MOS/386™ solves both aspects of this problem. Password protected security allows you to assign file, directory, and task access to each user. Plus, files and records are locked using either PC-MOS' proprietary system or NETBIOS emulation.

9. Remote Access

It's been said that information is power...which makes PC-MOS/386™ a deadly weapon to your competition. Imagine on-the-road salespeople being able to file call reports and access your latest inventory data. Picture executives being able to access your corporate database from across the country, or around the world—giving them the information they need, when they need it.

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10. The Price...As you evaluate operating systems, ask yourself if it's reasons you're considering...or rhyme. Ask if you're getting a system for tomorrow, or one that was made for yesterday. See if you're being forced to buy new hardware because of *their* software.

And consider this.

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The Write Stuff

If you ask 13 people to name their favorite word processor, you may get 13 different answers. If you ask 1,300 people, some patterns are sure to emerge. *PC Magazine* posted a survey with several questions about word processing programs on the Interactive Reader Service and then tallied 1,271 re-

sponses. We wanted to determine which word processors are the most popular, which ones seem to be declining in popularity, and what factors might make a person switch from one program to another. Clearly, finding the ideal word processor

1. Which word processor do you use now?

Our results show that the most popular word processing program on the market today is *WordPerfect*. Twenty-seven percent of those responding named it as the word processing program they currently use. *WordStar* was number 2, with 19 percent, and *Microsoft Word* came in third with 11 percent. Rounding out the top five were *MultiMate* with 7 percent and *PC-Write* with 6 percent. In total, readers named more than 70 other programs as the ones they used, although some received only one vote.

<i>WordPerfect</i>	346	27%
<i>WordStar</i>	245	19%
<i>Microsoft Word</i>	144	11%
<i>MultiMate</i>	89	7%
<i>PC-Write</i>	73	6%
<i>DisplayWrite 4</i>	55	6%
<i>PFS: Professional Write</i>	51	4%
<i>Q&A Write</i>	30	2%
<i>Volkswriter</i>	28	2%
<i>Leading Edge</i>	25	2%
Other	185	15%



2. Which word processor did you use before this one?

Assuming that many users have experienced more than one word processor in the course of their PC careers, we asked our respondents to name the word processor they had most recently left behind. Thirty-four percent of the respondents said they were still using the same program they had started on. Of those who have changed, 39 percent reported that they have abandoned *WordStar* along the way, and 10 percent have forsaken *MultiMate*.

<i>WordStar</i>	324	39%
<i>MultiMate</i>	80	10%
<i>WordPerfect</i>	42	5%
<i>DisplayWrite 4</i>	40	5%
<i>Microsoft Word</i>	40	5%
<i>Leading Edge</i>	26	3%
<i>PFS: Professional Write</i>	25	3%
<i>Volkswriter</i>	24	3%
<i>PC-Write</i>	21	3%
<i>EasyWriter</i>	17	2%
Other	197	22%



3. What are the three most commonly used word processors in your company?

We asked our participants to name the three most prevalent word processing programs in their offices, as opposed to the ones they would otherwise use personally. The results closely mirror those of our first question. *WordPerfect* is number 1 (44 percent), *WordStar* and *Microsoft Word* round out the top three (35 percent and 19 percent, respectively). *MultiMate* is fourth (18 percent), and *DisplayWrite* jumps in at number 5 (13 percent). Because three mentions were solicited, the percentage total exceeds 100 percent and the responses exceed 1,271.

<i>WordPerfect</i>	560	44%
<i>WordStar</i>	451	35%
<i>Microsoft Word</i>	246	19%
<i>MultiMate</i>	237	18%
<i>DisplayWrite 4</i>	164	13%
<i>PFS: Professional Write</i>	101	8%
None	74	8%
<i>Leading Edge</i>	58	4%
<i>XyWrite</i>	29	2%
Other	281	21%



can be a frustrating search for anyone, but one respondent reported he is up to the challenge. "Yes, I'm going to change word processors," he said. "I'm changing to one I wrote myself."—**Donald P. Willmott**

Donald P. Willmott is an assistant editor of PC Magazine

4. Which word processor do you use at home?

At home, the same trio prevails—and in the same order: among respondents who use a word processor at home, 56 percent use one of those top three programs as their personal word processor. *PC-Write* is fourth in home-use popularity (7 percent), and *Multimate* is fifth (6 percent). Popular write-in candidates included *Webster's NewWorld Writer*, *Textra*, and *PFS:Professional Write*. A few respondents disclosed an awful truth. They use Apple computers at home.

<i>WordPerfect</i>	298	26%
<i>WordStar</i>	219	19%
<i>Microsoft Word</i>	128	11%
<i>PC-Write</i>	78	7%
<i>Multimate</i>	71	6%
<i>PFS:Professional Write</i>	51	4%
<i>Leading Edge</i>	26	2%
<i>Q&A Write</i>	24	2%
<i>VolksWriter</i>	24	2%
Other	236	21%



5. Why did you change to a new word processor?

Most people (35 percent) made the switch to a new word processor for two basic reasons: to get more features and to achieve better performance. The only other single reason reported by a large number of respondents (10 percent) was to be compatible with the programs and operating systems of the offices in which they work.

To get more features, better performance	441	35%
To be compatible with office systems	121	10%
The previous program was too complex	95	7%
To get a program more suited to my job	90	7%
My company changed programs	69	5%



6. If you were going to change word processors now, what program would you change to?

Fifty-eight percent of our respondents said they wouldn't even consider switching programs. Of the rest, 16 percent like *WordPerfect*, and 13 percent would try *Microsoft Word*. Standouts in the write-in crowd included Lotus's *Manuscript*, *PC-Write*, and *VolksWriter*. What features might induce a change? Dozens of suggestions were made, including things like automatic grammar checking, the ability to strike through text, strong mouse support, or greater graphics integration with text.

<i>WordPerfect</i>	196	16%
<i>Microsoft Word</i>	159	13%
<i>XyWrite</i>	46	4%
<i>Multimate</i>	24	2%
<i>Q&A Write</i>	21	2%
<i>WordStar</i>	21	2%
<i>PFS:Professional Write</i>	18	2%
<i>DisplayWrite 4</i>	9	1%
Other	59	5%



■ WORD PROCESSORS

Advantage: *WordPerfect*.

Newer, faster PCs and small improvements beginning with Version 3.0 have helped *Word*, but until Version 4.0, the program was still sludgy. Clearly responding both to *WordPerfect*'s speed advantage and to users' complaints, Microsoft undertook a major speedup/overhaul in Version 4.0, and now *Word* is about as fast as any other general-purpose WP program. It's pulled even with *WordPerfect*, but both are still slower than that famous speed demon *XyWrite*.

WHEN LESS IS MORE Not everyone needs or wants a *Word* or *WordPerfect*, of course. For many users, a smaller, simpler, and cheaper program makes more sense. And as good as both the market leaders are, both require a substantial learning period to get up to full speed on real-world work in the office or at home.

Is that investment in the learning curve for a big-league word processor likely to be repaid for the executive who just wants to write a few memos, or the home-PC user who wants to write letters to friends?

For many casual word-processing users, a simpler, less-expensive but still smart and powerful program, such as *Q&A Write*, is a better answer. Software Publishing's *PFS:Write*, followed by the same company's newer *PFS:Professional Write*, once owned the market for medium-price, easy-to-use word processing software.

But when Symantec carved the already good word-processing module out of its *Q&A* multifunction package, made it even better, and released it as *Q&A Write* last summer, the company stole the thunder in the middle of the market. And a big chunk of market share.

Q&A Write is an anomaly: a program capable of handling virtually everything business WP packages ought to be able to handle—yet easy enough to learn that new users can become productive in an hour, wizards in a day. "Why," Symantec asks, "buy more word processor than you can possibly use?" Why, indeed?

Another trick has been to pack code into a smaller space, allowing vendors to produce special "lap-portable" editions of their programs. Able to fit on single 720K microfloppy disks, these programs usually

offer subsets of the main program, those core features most users need most often. And they frequently include additional functions beyond word processing, such as a simple spreadsheet or a communications program.

WordPerfect Executive began this trend in 1987; now *OfficeWriter Express* and others are jumping in.

AND WHEN MORE IS MORE Other vendors are finding different ways of separating themselves from the word processing pack.

MicroPro, the company that brought us


*IBM's DisplayWrite,
another hand-me-down
from the days of
dedicated word processing,
when it ran on
DisplayWriter hardware,
continues to do well.*

WordStar, is now getting back to its WP roots after dalliances with *InfoStar*, *CalcStar*, and other assorted FalseStars. No word processor has ever been as common in offices as *1-2-3* is today, but if any came close it was *WordStar*. But others left that classic behind, packing more and more value into their programs, enhancing them with features that could only be purchased as add-ons to *WordStar* if they were available at all.

Today, *WordStar* is coming back with new releases of its two corporate versions, *WordStar Professional* and *WordStar 2000*. MicroPro International is adding value through bundling—with a vengeance. New releases of *WordStar 2000* will include, in various permutations, copies of Revolution Software's *Cruise Control*, for faster cursor movement and elimination of cursor overrun; APG's *In-Ser*, for dropping graphics into the middle of text documents; Richburg's *FileLocator*, for internal free-text search and re-

trieval; Brown Bag's *PC Outline*, to add outlining functions; Athena's *Fill-a-Form*, for laying out and filling in office forms; TimeWare's *Showtext*, for producing overhead transparencies, signs, and other items that require oversize type; and in the legal edition, two excellent products from JURISoft: *CiteRite*, a style checker for legal citations, and *CompareRite*, for comparing additions and deletions in successive versions of a document, often called "red-lining."

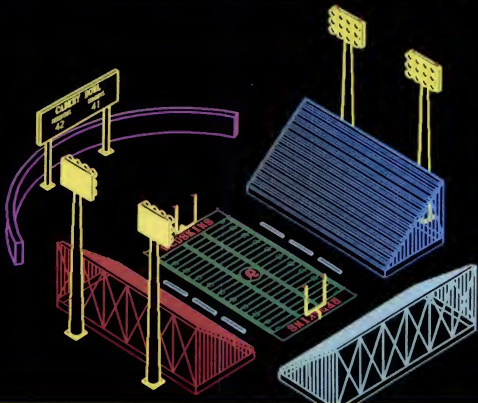
Whew!

WHERE ARE THEY NOW? Some former leaders in the PC-WP business are much less visible today than two or three years ago. *MultiMate*, for example, was acquired by Ashton-Tate just as founder Wil Jones was trying to move it onto IBM System 36 minis and even bigger IBM mainframes. Ashton-Tate quickly shut down the upsizing projects, and instead has released new and improved versions of its product (including *MultiMate Advantage III* this year).

MultiMate continues to command a loyal following in the installed base of word processors; as a PC-based near-look-alike of Wang dedicated word processor software, it was chosen by many of those users when they were changing over from Wangs to PCs several years ago. Yet it's no longer the market leader it once was in new-unit sales. The program suffered too long from a crippling page-orientation: it viewed each page of a document as a separate entity, which meant users couldn't see the bottom of page 13 and the top of page 14 without moving back and forth from screen to screen.

OfficeWriter has done better by the Wang idea than *MultiMate*, and has steadily nibbled away at *MultiMate*'s base. While the latest version of *MultiMate* extends the Wang-WP metaphor well beyond what Wang implemented on its dedicated WP machines, new and better metaphors have come along, illuminating the failings of the Wang approach. *MultiMate* feels increasingly like the last and most heavily burdened expression of an obsolete and irrelevant idea.

IBM's *DisplayWrite*, another hand-me-down from the days of dedicated word processing, when it ran on IBM's pricey



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CIRCLE 115 ON READER SERVICE CARD

■ WORD PROCESSORS

DisplayWriter hardware under the name *Textpack*, continues to do well, principally in businesses where the pixie dust falling from the letters I-B-M is just irresistible. The program itself, however, even in the current, much-improved *DisplayWrite 4* version, remains highly resistible. Despite drop-down menus and a few other appropriations from more-modern software, *DisplayWrite* still looks and feels like a product from the seventies. It also continues IBM's amazing hostility to the world of non-IBM printers: *DisplayWrite* directly supports only IBM-brand output devices, still ignoring Hewlett-Packard La-

serJets and other inventions that lie beyond the Blue horizon.

DRAWING THE LINE The new combination of flexibility (which is what writers really mean when they say "power") and ease of use represented by programs like *Q&A Write* marks new price/value points for the software business. Indeed, the improvements in both areas in many of the programs reviewed in the following pages have made it difficult to categorize these products.

Two years ago, in our last comprehensive WP review, we divided WP programs into personal, professional, and corporate categories. Even then, many products could have been listed in more than one category.

This year we've acknowledged that breadth of suitable uses by dropping the categories—all products reviewed in this special issue are listed alphabetically—and by adding our measure of the suitability of each program for those three general kinds of uses, as well as for legal and desktop publishing applications.

We found a number of products that, while crossing the boundaries between narrow applications categories, still seemed best-suited for certain applications.

Thus we have included *Lotus Manuscript* and *Celebrity* in our assessment of scientific and technical word processors, coming up in future issues. Arguably, both of them could also be considered corporate word processing products, and no doubt they will continue to find wide use.

AMONG THE MISSING There are other products we'd have liked to have seen in these pages: Wang's new PC-based WP package, unavailable and the victim of Wang's closed-mouth approach to new-product releases; and especially *Sprint*, the new chameleon-interface word processing program announced almost a year ago by Borland International, but not yet available in the United States. Users of *Sprint* are supposed to be able to convert its "look and feel" to imitate those of several other popular word processors, then use those products' commands in lieu of *Sprint*'s own interface. That sounded promising, but unfortunately Borland wasn't able to

get a release-level copy of *Sprint* to us in time for this issue.

Borland has just begun shipping a French-language version of *Sprint* in Europe, where by some reports it has become an early hit. Borland says it didn't want simultaneous release of both its new spreadsheet, *Quattro*, and its new word processor, *Sprint*, to confuse U.S. customers,

*The testing scripts
for the word processing
evaluations ran
more than 100 pages and
identified more than
600 features our 48
reviewers checked.*

and so it has held up domestic shipments of *Sprint*. Sounds good, anyway.

ON THE RACK The testing scripts for the word processing evaluations ran more than 100 pages and identified more than 600 features our 48 reviewers checked. Of the 600, about half of those features were deemed important enough to readers to make it into the comparison charts that accompany the reviews.

In addition to feature-for-feature comparisons, PC Labs developed a special nine-point performance testing script for these programs, which gave our evaluators a basis for measuring such characteristics as the time required to load a document, the time required to save a file, the number of keystrokes required for common actions such as search-and-replace routines, and more.

In the pages that follow, you may find more than you ever wanted to know about today's PC word processors. You will find the most exhaustive, comprehensive comparisons of IBM PC word processing packages ever undertaken.

Jim Seymour is a contributing editor of PC Magazine.

TASK ANALYSIS

Allegory

SUITABILITY TO TASK

Professional

Corporate

Personal

Legal

Desktop Publishing

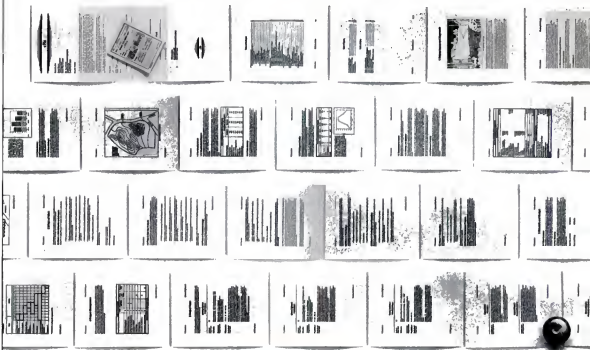


Finding the right word processor—that magic piece of software that will fill all the user's word-working needs—is not a simple chore. The reality is each word processor has a level of appropriateness to the purpose for which it is used. A program that shines as a creative writing tool may be a dim bulb around the office.

PC Magazine required all reviewers to give a "Suitability to Task" rating based on their assessment of a program's performance in the professional, corporate, personal, legal, and desktop publishing environments.

These subjective ratings, on a scale from 0 to 4, are presented in an index like the one shown above opening each review. The ratings translate as follows: 0—Not Suited; 1—Poorly Suited; 2—Some Capability; 3—Well Suited; 4—Buy It.

How to process documents instead of words.



Ho hum, your word processor enables you to process words. But today, when you're creating a wide range of business documents, you often have to process much more. Graphics, columns, tables, equations, etc.

Lotus Manuscript® is a complete document creation system that can handle anything from a one-page memo to an 800-page manual. Manuscript can mix text and graphics on the same page, graphics from Lotus® 1-2-3® Symphony®, Freelance® Plus, and Graphwriter II®. It can also import spreadsheets and charts, plus diagrams and scanned images.

With our Integrated Outliner you can collapse a document to navigate the outline, or move any size section with just a few keystrokes.

You can globally format an entire Manuscript document, or format by sections.



With our Document Preview feature you can see how any page will look before it's printed. Zoom capability lets you take a closer look at graphics and equations.

Manuscript's Document Compare feature highlights changes between revisions for foolproof proof-reading.

Our powerful Print Formatter gives you control over the look of your document, from position and size of graphics, to fonts, point sizes and more.

Manuscript also takes full advantage

of today's printing technology, from dot-matrix to laser, including PostScript® printers.

Manuscript is designed to work on most IBM® PCs and compatibles.* Its familiar 1-2-3 interface makes it easy to use. And our Manuscript evaluation kit makes it easy to try. For \$10.00, you'll get a presentation disk, working software, and a tutorial manual. To get your evaluation kit, call **1-800-345-1043** and ask for demo kit QJ-1450.



Lotus Manuscript

■ WORD PROCESSORS

Reviews of these 55 word processors are arranged in alphabetical order by product name, from Allegory to Zen-Word. Read them all or refer to the table of contents for quick location of specific reviews and our Editor's Choices.

The programs reviewed in this issue cover the range of professional, corporate, and personal word processors, as indicated by the suitability-to-task ratings you will find at the beginning of each review. In the next issue you will find reviews of the word processing abilities of integrated programs like Enable and Microsoft Works. Scientific and technical word processors such as Lotus Manuscript and Celebriety will be covered in future issues.

Allegory

SUITABILITY TO TASK

Professional

Corporate

Personal

Legal

Desktop Publishing



If you're the manager of a Wang-trained, large-volume word processing department, *Allegory*, Version 2.21, offers you a significant option. It lists for \$395 and it's fast, has a great filing system, includes several kinds of automatic backup, and offers password options at both the directory and file levels.

However, it also has the same drawbacks as do other packages that emulate Wang's dedicated word-processing systems. It is page-oriented; the default mode is overstrike; and you must go through some exhaustively detailed summary screens before editing or printing. As with the Wang, *Allegory* is a program designed primarily for heavy-duty document processing, not for composing text or creating fancy report formats.

Some key combinations are not Wang-like, but the changes are logical and easy to remember. There is a spelling checker

DOCUMENT SUMMARY

Document ID: B:TEST

Document Title: 4-day invite
Operator: C. Stewart
Author: C.M. Murray
Comments: invitation to dinner party
Glossary To Attach:

STATISTICS

Operation	Date	Time	Work Time	Keystrokes
Created:	12/01/87	04:30 PM		
Last Revised:				
Last Printed:				
No. Of Pages:	1	Total:		

You can search Allegory's document summaries for a document title. The program lets you search on other fields in the document summary screen, as well.

function (based on an 80,000-word dictionary from Proximity/Merriam Webster) that offers a full range of features, including detection of repeated words (like "the the"). *Allegory* also has a truly programable glossary function that preserves not only boilerplate text, but also macros that involve any combination of keystrokes to execute any type of function.

Allegory's search feature is one of its most interesting. As soon as you enter the first letter of a search string, the cursor moves to the first incidence of the letter in the text. As you add each letter, the cursor jumps to the first match of that string and continues searching as the string gets longer, so that the program virtually reaches the final match by the time you have completed typing the string.

OPENING A WINDOW *Allegory* does windows, a critical feature not yet standard in the Wang-like clones. However, no more than two documents can be viewed at once, either in alternating full screens or in a split-screen mode. The dimensions of the split screens are not adjustable, and you are limited to eight lines of text per window. Print menus offer exhaustive options, including print merging and the op-

portunity to review and delete from the print queue. The program currently comes with drivers for 150 printers, and Foresight Software claims that if you can come up with a printer model *Allegory* doesn't support, a driver will be written for you on demand—no questions asked.

In fact, hardware flexibility is a compelling reason to consider *Allegory*. The



FACT FILE



Allegory, Version 2.21
Foresight Software
P.O. Box 424
Truckee, CA 95734
(800) 227-8086
(916) 587-2510
List Price: \$395

Requires: 512K RAM,
two disk drives (hard disk recommended),
DOS 3.3 or later.

In Short: A very fast Wang-like word processor that offers a powerful document-filing system, password options, and exhaustive protection of data integrity; probably not for those without experience on similar programs. Not copy protected.

CIRCLE 676 ON READER SERVICE CARD

10 Megabytes / 4 Minutes*

FASTBACK PLUS

Backup software for your hard disk.

JUST UNLEASHED

More Power, More Performance, More Versatility!

Fifth Generation Systems, creator of the world's leading backup utility, has just unleashed FASTBACK PLUS, the next generation of power and performance in backup products. FASTBACK PLUS is even faster than its predecessor, and even easier to use. The new data compression feature can actually cut the number of disks you use in **half**.

FASTBACK PLUS is as flexible as it is fast. You can now backup and restore from any DOS device including DOS-compatible tape. And with the touch of a key you can record and playback any backup scenario. With FASTBACK PLUS you can backup 10 Megabytes in an incredible 4 minutes or select and back up an individual file in just a few seconds.

FASTBACK PLUS' speed and ease of use actually encourages frequent backups. As one reviewer put it, "If it's not FASTBACK, you won't use it."

So don't wait for a hard disk disaster to decide that your data needs the best protection. See your computer dealer today and unleash the power and performance of FASTBACK PLUS, the leader in data insurance.



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(800) 225-2775 or (714) 259-0541

For registered FASTBACK users who would like exchange information please call (804) 281-7681.

Requires 448K RAM and MS-DOS 2.1 or higher.

* On high density media. Time typically doubles with low density media.

* This product is in no way associated with or has origin in Fisher Scientific or Allied Corporation. MS-DOS is a trademark of Microsoft Inc.

CIRCLE 266 ON READER SERVICE CARD

GET SMART!

Just think! A word processing program that watches while you work and then emulates "your" style.

Current PC-based word processing software is fast, powerful, and a remarkable bargain. And the next generation of PC-WP will be faster and more powerful still, adding many more features to help users turn out better-looking documents.

So where do we go from *there*?

The truth is that none of the current WP programs, nor many of the next crop, are terribly intelligent yet. While they're full of features to help us manage the job of getting words on paper in ever-faster and prettier forms, none challenge head-on the basic premises of how we handle word processing.

All extend the old typewriter metaphor, sometimes very powerfully, but none go very far beyond giving you a faster, more muscular typewriter. In other words, they don't use the power of the computer for much beyond mechanizing the work, leaving our *approach* to that work much the same.

In a column in *PC Magazine* 2 years ago ("Advise and Consent," June 10, 1986), I offered some thoughts on how truly smart word processors could work. At that time, at least three vendors were working on these concepts. They still are . . . but the ideas are still in the lab. Some of these ideas have proved to be more intractable than any of us expected; others haven't proven difficult at all, but the vendors are afraid you and I will find

them intimidating. That's nonsense, but nonsense is often transformed into wisdom by the peculiar alchemy of the computer industry.

The essence of the smart word-processing program is that it's . . . well, *smart*. Using techniques from artificial intelligence researchers, it watches us at work, learns what we do and don't like, discovers how we work—then starts to take on part of the burden for us.

WORD WIZARDRY It does all that through what is often called a software "agent": an imaginary creature inside the program who, watching us and noting our habits, begins to change the program's own behavior, from points as simple as modifying defaults to finishing the typing of words we've begun.

Here's an example.

Say you load your new copy of *Word-Whiz* onto your PC and start to work. At first you don't notice much beyond the intelligent interface and full feature set. As you do your work over the first week or two, though, *Whiz* notices that you typically write four kinds of documents. The simplest are short one-page letters of just a few paragraphs, with the date and formal address at the top, a "Dear So-and-so:" salutation, and the usual "<TAB> <TAB> <TAB> <TAB> Sincerely, <ENTER> <ENTER> <ENTER> <ENTER> <TAB>

<TAB> <TAB> <TAB> John Doe <ENTER> <ENTER>" at the bottom of the page.

The second common document you write is much like the first, but has narrower margins at the left and right, begins higher on the page and runs lower—all in the interest of getting that letter onto a single page.

The third common style is simply a multipage letter based on the same "look" you like in long one-page letters. And the fourth style you often use is what we'll call a report, with tight margins all round (but a little wider on the left, for easy readability after binding or stapling), justified text, and centered bold-faced subheadings dropped in from time to time.

So after a few weeks, as you start a new document, *Whiz* decides it's probably one of those short one-page letters. The screen comes up with those wide margins in place. As you type the last character in the date line (identified by a four-digit numerical entry, the first two digits of which are "19"), *Whiz* automatically puts in a couple of carriage returns, positioned for the inside address.

When you type the fifth digit of the ZIP code (again, identifiable by pattern), *Whiz* matches your own usual action at that point by inserting a couple of carriage returns, typing "Dear" and a space, and waiting for you to add the

program's list price is about \$100 less than others like it. But *Allegory* has been designed to run on a number of the cheaper compatibles, and again the company seems eager to assist in adapting it to any eccentric hardware configurations. There are obvious disadvantages to dealing with very young, very small companies like Foresight; however, one of the advantages is that you can get amazing amounts of support.

DATA PROTECTION One area where *Allegory* offers more than do programs like *MultiMate* is in its "library" structure, which files documents in mandatory subdirectories. This process allows the system manager to use optional passwords at either the document or library level. Your data is guarded with an automatic save function—called "autowrite"—which, unless otherwise configured, operates as a default setting that can be toggled on and

off. Autowrite saves the file if you have not pressed a key for 10 seconds, as well as every time that you go to a different page or make a pagination change in the document. The process is remarkably unobtrusive; however, if you have a fetish about never accessing the disk, the toggle option is there. *Allegory* is also vigilant about querying your attempts to leave edit mode without saving changes. Even if you refuse to save updates or additions, it makes a

name. Type a colon to complete the salutation, and *WordWhiz* inserts two more carriage returns and tabs over five spaces so you can begin the body of the letter.

REFORMATTING ON THE FLY Because *Whiz* initially assumes this will be a short letter, it has already set the left, right, top, and bottom margins to generous figures. But it has also noticed that when you go beyond a certain number of lines of text, you move to those narrower margins of a long one-pager. So when you hit that point in your typing, it automatically adjusts the margins to the narrower settings it noticed you prefer for full-page letters.

As you keep typing, it becomes clear the letter will spill over to two or more pages. Now *WordWhiz* identifies this as an example of that third type of work it's noticed you handle, and automatically inserts page headers with the style and information it has noticed you prefer.

As you can guess, when you type the last word of the letter, hit the Enter key a couple of times, then hit the Tab key more than once, *Whiz* figures out that this is the bottom of the letter, and types the "Sincerely" and your name to end the letter.

But what if you had at one point in this exercise hit *WordWhiz*'s keystroke code for centering a heading? *Whiz* would have instantly realized this wasn't a letter

at all, but one of those reports it had noticed you sometimes write. And it would have automatically rejiggered margins and made the other changes needed to reformat to that standard. Including boldfacing that subheading, of course. . . .

R2D2 WP? Sounds spooky? I've worked with prototype products that incorporate some of this technology, and at first it is a little spooky. But you quickly become accustomed to that kind of productivity-enhancing convenience—which can, of course, be turned off completely with a keystroke or two.

The only hard part is going back to today's comparatively primitive word processors.

Smart PC word processing programs like the mythical *WordWhiz* won't really be along until the early 1990s. Some (like *MindReader*, reviewed in this issue) are beginning to surface, but they are still rough and are more novelties than serious word processors. They need the memory space offered by OS/2, so don't look for them running under DOS. But do look for them to become enormously popular.

That kind of truly smart word processor, finally using the computer's capacity to act as an intelligent machine (which happens to be the British phrase for what we clumsily call "artificial intelligence"), is only a bit over the horizon.—**Jim Seymour**

temporary file of your discards.

Allegory has no trouble holding large documents in RAM. The speed with which you can flip through pages or GOTO a specific page overcomes many of the drawbacks of page orientation. In fact, *Allegory* further surpasses this potential limitation by allowing the creation of thematic, oversized pages that can be repaginated before printing. One caveat here: repagination will not affect ordinary text, but


special formatting symbols can be lost in the process.

Allegory uses the gray Plus key as an execute key and the gray Minus key as a cancel key. And you can use Alt-Plus and Alt-Minus for super-execute and super-cancel—commands that allow you to avoid one or more layers of additional queries. These key assignments may be bothersome if you're used to striking the Enter key to execute commands.

SOME DRAWBACKS Don't look for WYSIWYG here: you don't even see line spacing. The program also lacks footnoting and math functions of any kind. These, combined with its inability to add line numbering, limit its usefulness in legal applications, an area to which it otherwise seems well suited.

Another drawback of the program is its inability to import files directly from other word processing packages or from *Lotus 1-2-3*. At the time this review was being written however, a direct file-transfer utility from Wang PCs was just being developed.

One major roadblock that could keep some departments from even considering


*Your data is guarded
with Allegory's
automatic save function—
called "autowrite"—
which unless otherwise
configured operates as
a default setting.*

Allegory is a lack of training aids. This is probably due in part to the frequent release of new versions (I saw three just while doing this evaluation). The company that markets this package presumes a preexistent Wang-oriented training structure. *Allegory*'s thorough and well-organized main manual talks to the system manager, while a spiral-bound quick-start tutorial is intended for the experienced user. But no documentation is geared specifically to the less experienced user, and there are no templates or charts, although you do get on-line help.

All in all, *Allegory* is a promising new member of the corporate word-processing fraternity. *Allegory*'s next release, which is supposed to include a networking version (and should be available in some kind of distribution by the time you read this review), is definitely worth a look.

—E. Atkinson

Bank Street Writer Plus

SUITABILITY TO TASK

Professional

Corporate

Personal

Legal

Desktop Publishing



1 2 3 4

The *Bank Street Writer* was developed by the Bank Street College of Education in New York City specifically for students and adults who wanted an easy-to-use word processing program. Its latest incarnation, *Bank Street Writer Plus*, a \$79.95 program from Broderbund Software, has a host of new features, including a spelling checker and a thesaurus, that make it more powerful and easier to use.

As in the original version, writing and editing are separate modes. You first compose text in the writing mode, then make any changes in the editing mode, hitting the Esc key to move back and forth between the two. This can be slow, but the functions are easy to reach with Esc, the cursor keys, and Enter.

A main menu line—located on top of the screen display and accessed by Esc—offers choices of Edit, File, Spell, Options, Disk, and Quit. All the choices except Quit lead to smaller, easy-to-understand submenus. Only the Options choice takes some time to learn, since it covers such functions as tabs, print formats, and macros.

A help command, Alt-H, pulls up a comprehensive menu—listing features such as centering, boldface, margins, page breaks, and indentation. You can access this command in writing mode; it is listed at the bottom of the screen. Most of the basics you need to know are listed somewhere on the screen when in writing mode.

During our test, the program responded crisply to all prompts and commands. Any lingering doubts we harbored—because of the original *Bank Street Writer*'s sluggishness—quickly vanished.

However, because *Bank Street Writer Plus* is intended for students and beginners, many simple procedures take several steps. For example, in order to save a document, you must go into File and say whether you want to save all of your work and whether you want to see other file names on the disk. Next, after saving, you must go back into File and clear the screen of the copy just saved. Then the program asks you to verify that you want to clear the file. Moving or deleting a block also takes several steps, and you can move or delete only up to 15 lines at a time. Such lengthy processes are common in this program, which frequently asks for verification to avoid error.

A FEW DISAPPOINTMENTS Not all the new features lived up to expectations. The new thesaurus does not list professional or colloquial terms and includes only a few business terms. It also occasionally missed words that could be used either as nouns or verbs but were not listed under both categories.

The spelling checker is a valuable addition, but it requires a little patience getting used to it. To check an individual word, you press Alt-S in the writing mode. However, to check an entire document or part of a document, you must first leave the



FACT FILE



Bank Street Writer Plus
Broderbund
Software Inc.
17 Paul Dr.
San Rafael, CA 94903-
2101
(415) 492-3200
List Price: \$79.95

Requires: 128K RAM for 5¼-inch disks, 356K RAM for 3½-inch disks; two disk drives; DOS 2.0 or later.

In Short: This new version of an easy-to-understand program aimed at the educational and personal-use market now has a spelling checker and thesaurus. Attractive for novices. Not copy protected.

CIRCLE 646 ON READER SERVICE CARD

writing mode for the main menu, go into Spell, and then indicate whether you want to check the entire file or only from the cursor to the end of the file.

HELPFUL ADDITIONS In the new *Bank Street Writer Plus*, the developers have added a function to search for anagrams. A pop-up calculator, along with a wildcard word-search facility, also makes the program valuable for personal pur-

PRESS ← TO CONTINUE.

PRESS ESC TO WRITE

	ADDITIONAL KEYS THAT MAY BE USED WHILE WRITING	
Alt	CTRL +, + Move cursor to previous or next word	
Rel	Home, End Move cursor to start or end of line	
pur	PgUp, PgDn Scroll text 15 lines up or down	t
cir	CTRL Home, End Move cursor to start or end of text	
exp	ALT A AVAILABLE space in memory	1
nit	ALT B BOLDFACE on/off	
←	ALT C CENTER - centers text	
	ALT D DISPLAY function key definitions	
	ALT F FORMAT (PRINTER) CHARACTERS on/off	ion
in	ALT I INDENT - indents left margin 8 spaces	of
fel	ALT L LINE - tab-stop display on/off	od,
so	ALT M MARGINS - indents both margins 8 spaces	
the	ALT P PAGE - forces a new page when printing	That
fel	ALT Q QUOTE - indents 8 spaces, prints single space	re
it	ALT X REFORMAT text	
san	ALT S SPELLER - check a single word	
sec	ALT T THESAURUS - find synonyms	
←	ALT U UNDERLINE on/off	
	ALT W WORD SEARCH	ould
hnt	ALT # CALCULATOR	

Bank Street Writer Plus has a convenient help menu, brought up by Alt-H, which allows access to most commands while you are writing.

The Product Market

Physical Attributes of Market

- Size of market
- Geographic location
- Demographic description of purchasers

Behavioral Characteristics of Purchasers

- When purchases are made
- How buying is done
- Purchasing influences

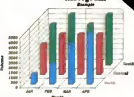
Sign-Master by Decision Resources

MARKET GROWTH

FISCAL	INDUSTRY RETAIL SALES (UNITS)	INCREASE VERSUS PREVIOUS YEAR
1982-83	8,523	16.3%
1983-84	8,880	17.1%
1984-85	11,870	18.6%
1986-87	14,244	20.0%
1987-88	16,183	27.7%

Diagram-Master by Decision Resources

Histogram Sample

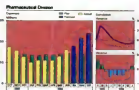


The Smart Series by Innovative Software

ABC Corporation Captures Market Share!

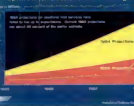


Harvard Presentation Graphics
by Software Publishing



LINK-A-GRAPH by ISSCO

Optimum for Electronic Mail Declining



Mirage by Zenographics

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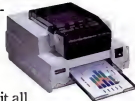
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■ WORD PROCESSORS

poses ranging from letters to games and crossword puzzles.

Printing documents is handled under File. The program supports an unlimited number of printers and lets you preview a document before it prints.

An on-disk tutorial contains eight brief lessons on using the program. You can progress through the lessons in order or try only those you think would be helpful. The program also includes an 87-page instruction book that is easy to read and has five helpful illustrations.

The customer support staff is pleasant, although most technical questions are referred to the program manager. I got a prompt response, although the manager did not know that the pop-up calculator worked with the program's IBM version as well as the Apple version.

Bank Street Writer Plus has its limitations; it would be hard-pressed to compete in the business market and is unlikely to meet the needs of advanced writers. However, its new features do give it more power, speed, and flexibility for personal use. With an easy format that breeds confidence and contains many safeguards to prevent mistakes, the program is a logical choice for beginners, especially families.—Charles Dervarics

CommandWriter

SUITABILITY TO TASK

Professional

Corporate

Personal

Legal

Desktop Publishing



CommandWriter is a middle-of-the-road program. It has most of the functions desired in a word processor but lacks many sophisticated features. An experienced person can master it in a few hours, but a new user might have problems with it.

You must obtain the program directly from Command Software Corp. The cur-

TDR-01

Pg 1 Ln 4 Col 21

PAH: Master → EnterInfo → **Interrupt**
 I7 * * * Master 9EnterInfo → Finish
 I4C-KeyMap Write 6C-Index 1
 IQuitPrint 2QuitPrint 3PrintMore → Master

1...2...3...4...5...6...7...

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Run, don't walk (or better yet, drive and get there faster) to the vacant lot at the corner of Juze and Pitts Streets, former home of the Fill-and-Fly Service Station.

A menu in the upper-right corner indicates which functions are assigned to which keys in CommandWriter's numeric keypad. Bold is shown here with a blue highlight.

rent version was released in November 1985. The package, which lists for \$150, consists of two disks (one containing the word processor; the other, help files); the manual; plus a Quick Start and Quick Learning spiral-bound primer.

MOVING THROUGH MENUS The program displays separate menus for each major function, such as edit, save, print, and file. The menus are always visible in the upper-right-hand part of the screen and are listed in the manual to explain the command paths that you use to move between functions. These paths are sometimes complicated, unless you write macros for frequently used sequences. For example, to retrieve an ASCII file, you have to go through five keystrokes before entering the filename.

You move through the menus with the function keys; *CommandWriter* comes with an overlay showing which menus the function keys access. Commands within menus are enabled with the numeric keypad. Pressing the Ctrl key toggles the keypad between entering commands and numerical entry.

Selecting and changing tabs, margins, the ruler line, and other formats are completely flexible. A help screen displays default settings; it also allows you to define

your own parameters and change almost all parameters either temporarily or permanently.

The help screens are excellent, and you can access them at any time without disturbing the text. For the first-time user, a help screen shows the layout and functions of the keys on the standard IBM PC keyboard.

Advanced users will appreciate a help




FACT FILE



CommandWriter,
 Version 2.7
 Command Software
 Corp.
 P.O. Box 5575
 Berkeley, CA 94705
 (415) 944-9434
 List Price: \$150

Requires: 256K RAM, two disk drives, monochrome monitor, DOS 2.0 or later.
In Short: *CommandWriter* performs most functions well, but its complicated command structure, which requires several keystrokes to accomplish a task, is cumbersome. It is best suited for users who have had previous experience with PC word processors. Not copy protected.

CIRCLE 66 ON READER SERVICE CARD



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screen that lets them alternate between one keyboard that shifts between uppercase and lowercase letters and another that has uppercase only. This help screen also provides a graphic illustration of all the standard ASCII characters. *CommandWriter* lets you redefine the keys to any ASCII

CommandWriter has a good system for using windows, temporary files, and backup files.

character, as well as define your own special characters, such as scientific ones.

A library function handles storage of special phrases or sentences, tables, formulas, and similar information, arranged in "shelves." You can have an unlimited number of shelves in the library. The library can also use EditMarks for inserting predetermined structures or information into the text. You can view the library shelves while working on your document.

The program has a good system for using windows, temporary files, and backup files. By design, there is no automatic file backup; a backup file is kept in RAM, and you have to instruct *CommandWriter* to save it to disk before exiting the program.

CommandWriter has several setup files for frequently used formats. You can also choose your own filenames for the setup files, and the program prevents overwriting of existing files.

CommandWriter's mail-merge function lets you customize forms and merge text into them. You can have both fixed and variable field lengths for forms; the forms can also include nonprinting leaders and trailers for printer sequence commands.

SAVING GRACE The program protects you from your mistakes. It displays an explanatory message when you attempt to execute commands that may result in lost information or inadvertent changes that deviate from the program logic, such as trying a command path that doesn't exist.

CommandWriter has an extensive dictionary and spelling checker routine. But manipulation is cumbersome (you have to repeat a series of keystrokes each time you want to correct a single word) and there is no thesaurus.

A strong feature of the program is its ability to generate an index. However, it does not have any capabilities for sorting and mathematical computations.

Besides a detailed index, the manual has an appendix of all default settings, but flow diagrams to illustrate the command paths would be helpful. The vendor reports that these are being developed. The primer is quite useful for quick reference.

Command Software provides technical support at no cost, and the technical staff is willing to discuss specialized applications with users. Printer drivers that are not currently in the package will be written at no charge if the user supplies printer documentation. A special scientific driver for the Epson FX printer is available for \$10.

CommandWriter does perform the most-common word-processor functions well and has some convenient utilities. Still, the complex command paths and the lack of explicit training exercises in the documentation make it a difficult package for the casual user or for an office environment where learning time is limited.

—Robert W. Fay

Cut & Paste

SUITABILITY TO TASK

Professional

Corporate

Personal

Legal

Desktop Publishing



Cut & Paste's place on the evolutionary scale of word processor development is somewhere between the typewriter and the very first word processor. The program lists for \$14.95, and you get what you pay for: it has only the barest essentials, even in



FACT FILE



Cut & Paste
Electronic Arts
2755 Campus Dr.
San Mateo, CA 94403
(415) 571-7171
List Price: \$14.95
Requires: 64K RAM,
one disk drive, DOS 2.0

or later.

In Short: This primitive word-processing package is for users who have no knowledge of computers. Its features are very few; what features it has are limited, and it runs outside of DOS. Copy protected.

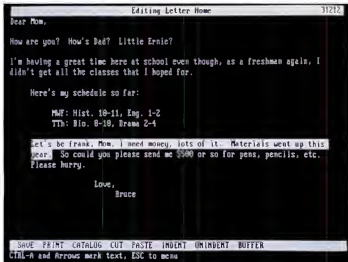
CIRCLE 600 ON READER SERVICE CARD

its documentation. Electronic Arts calls its product "the remarkably simple word processor," and they're not kidding. Experienced users will have forgotten more features of current word processors than this program has. *Cut & Paste* is solely for beginning users whose goal in word processing is to overcome their fear of computers, rather than to handle their correspondence.

The program operates under its own proprietary operating system, making everything you have ever learned about DOS irrelevant. The proprietary system lets you format and copy disks, as well as delete and rename files. However, any other type of file or data maintenance is impossible, including importing and exporting files. This prevented me from using the *PC Magazine* test document. Booting the program at beginning and end is the only method of access and departure for *Cut & Paste*. To top it off, the program is copy protected, leaving you at the mercy of your floppy disk drives.

REMARKABLY SIMPLE The program does an adequate job of deleting and moving information during text editing. However, the cursor movement control is limited to moving from left to right and using a Tab key preset to five spaces, which makes marking the text area to be edited difficult.

The "remarkably simple word processor" lives up to its billing with its screen display, too. The editing mode shows the



A message line at the bottom of Cut & Paste's screen tells you how to highlight text while a mini-menu above the message line lists its limited text-handling options.

commands for save, print, catalog, cut, paste, indent, unindent, and buffer. To get to the commands, you press Esc. The program does allow you to use Ctrl-key com-

mands to let you know how much memory is available for your file. During testing, an attempt to write a file that exceeded the available disk space produced an error message, to the program's credit, and it did not trash the file.

The program's simplicity really shines in the area of printing. There are two preset formats that you can change, one for standard 8½- by 11-inch pages, another for envelopes, and one format that you can set up any way you want. Each time you print, you can select a one-line header, which has to be centered; automatic page numbering; single or double spacing; and the number of copies you want. *Cut & Paste* doesn't permit the storage of printing formats to be attached to specific documents.

The program's documentation was only 13 pages long and had more illustrations than text. However, the technical support department at Electronic Arts was very helpful in answering my questions.

The people at Electronic Arts described the program as being at the end of its product cycle, and there are no plans to enhance or update it. In today's sophisticated software market, *Cut & Paste* just doesn't cut it. —Gregory Scott Wilfong

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CIRCLE 212 ON READER SERVICE CARD

Cut & Paste is solely for beginning users whose goal in word processing is to overcome their fear of computers.

mands as a shortcut for some of the editing commands but does not provide any templates or on-line help to explain the keys.

The prompting is virtually nonexistent, except for the message "Arrows select command, Return does it," which is on nearly every screen. There are 15 error messages, which address only such basics as lack of disk space, memory, printer problems, and disk operation. *Cut & Paste*

Dac Easy Word II

SUITABILITY TO TASK

Professional

Corporate

Personal

Legal

Desktop Publishing



1 2 3 4

In 1985 Dac Software released its inexpensive *Dac Easy Accounting* program and established a reputation as a company that delivered value-packed software. That same year, the company released a word processing program, but because of its limited features, it received less fanfare than its number-crunching cousin.

In 1987 Dac released new versions of both. *PC Magazine* promptly declared *Dac Easy Accounting* no longer just a good buy but a "great one." The \$49.95 word processing program, *Dac Easy Word II*, didn't show as dramatic a change, but it's still much improved.

For less than the cost of a restaurant dinner for two in New York City, *Dac Easy Word II* serves you pull-down menus, context-sensitive help, a spelling checker, auto-save capabilities, a macro language, mail-merge functions with a database to track your address list, windowing capabilities that let you keep as many as four documents active at once, full editing capabilities, a DOS shell, support for more than 200 printers, and the ability to handle large files.

Dac claims that you can create documents of more than 500 pages without encountering any problems until the page count nears 800. We didn't test the claim, but unlike many other inexpensive programs we tested, *Dac Easy Word II* handled our 50K test document without a hitch.

LITTLE EXPERIENCE NEEDED

The program is easy to install and easy to learn. Anyone with even a little knowledge of word processing programs can get it up and running with nary a glance at the manual. You simply create a directory for the

program, copy the files from the two program disks, and type INSTALL. You set your printer, search path, extension, and color.

Dac Easy Word II will let you load three printer drivers, and if you wish, you may erase the other 234 available options after installation. You can even customize your screen display in a rainbow of colors.

To start the program, type DEW (*Dac Easy Word*), and *Dac Easy Word II* takes you to the edit screen, where you simply type to create your document. Help appears at a touch of the F1 key; all your editing and formatting functions are at F10, which brings up a master menu to let you format your document and to access print, spelling-check, search, window, and macro functions. You also load and save documents through the File option on this master menu. Hitting the Ins key toggles between insert and overstrike modes.

Dac Easy Word II gives you full editing and format features, including bold, underline, italic, and compressed print. The number of character formats available to you, however, will depend on which printer you are using. Additional features include the ability to center text, right and



FACT FILE



Dac Easy Word II
Dac Software Inc.
4801 Spring Valley Rd.,
Bldg. 110B
Dallas, TX 75244
(800) 992-7779
(214) 458-0038
List Price: \$49.95

Requires: 256K RAM, two disk drives, DOS 2.0 or later.

In Short: Great value. Spelling checker, split- and full-screen windows, mail-merge, database, and limited macro facility are excellent for personal or small-business use. Not copy protected.

CIRCLE 678 ON READER SERVICE CARD

left justify, block defines, moves, deletes, and prints.

The spelling checker is somewhat limited. It includes only about 80,000 words: when spell-checking this review, it did not recognize the words *offices*, *files*, *database*, or *nary*.

Dac Easy Word II provides best guesses through a "browse dictionary" func-

File(1): D:\DOWORD.REV

Insert

You can do a universal search and replace on a word but that, too, has its limitations. The function is string-sensitive and, if you don't verify you may find that words like *their* and *thesis* become *air* and *asis* when you want to change all "the"s to "a"s.

The macro facility is a handy feature and you can define up to 26 macros per subdirectory. You create a macro by turning on the Macro function through the main menu, naming the macro with a letter, typing your macro, and then saving it. To activate the macro you simply hold down CTRL and type

Verify Replace

Replace: the

With: a

Proceed? [Y] N I

Press Esc to Interrupt

Dac Easy Word II's search-and-replace feature is string-sensitive, so it is a good idea to ask the program to verify each replacement. Or else, as shown here, the word *thesis* might become *asis* if you try to replace the word *the* with the word *a*.



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■ WORD PROCESSORS

tion. The phrase is appropriate. When you ask for Browse, the program displays all the root words and derivatives that begin with the first and second letters of the misspelled word. You scroll through those of-

Dac Easy Word II's macro facility is handy: you can define 26 macros per subdirectory.

ferings to find the correct word and can then change a misspelled word, ignore it, or add an unrecognized word to the dictionary.

You can perform a universal search-and-replace function on a word, but that, too, has its limitations. The utility is string sensitive; therefore, if you don't verify the change, you may find that words like *their* and *thesis* become *air* and *asis* when you change all the *e*'s to *a*'s.

The macro facility is a handy feature; you can define up to 26 macros per subdirectory. You create a macro by tumbling on the macro function through the main menu, naming the macro with a letter, typing the macro, and then saving it. To activate the macro, you simply hold down Ctrl and type the letter name.

WINDOWING, MAIL-MERGE *Dac Easy Word II* will let you divide the screen into as many as four windows, load separate documents into each, and move among them to cut and paste text. It has a zoom feature that lets you blow up any one of the windows to full-screen viewing while the others remain in memory.

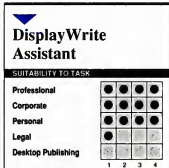
The mail-merge function lets you keep names and addresses in a database, which you use as your variable file when running a mass mailing. You can establish up to 18 fields in a record and file away as many records as your disk will hold.

Dac Easy Word II will save separate mailing lists under filenames ending with an *.LST* extension and will let you go back, search your directories for the lists, and select the one you wish to use just as

you would select a document to edit.

The manual is organized like a printed tutorial. It walks you through the program and offers clear, concise explanations of how to use the features. Each chapter ends with a short summary page that is good for quick reference. The program is intuitive, and the manual is so easy to understand that you probably won't need much help. If you do, there is a support telephone line at the Dac offices—though, before your queries are answered you may be on hold listening to a Texas radio station.

With *Dac Easy Word II*, Dac has managed to extend its reputation for good low-cost software into the word processing market. The program is ideal for anyone looking for a solid word-processing program to use at home or in a small business. And its ability to link with other members of the Dac software family makes it especially attractive to anyone already using Dac's accounting or database programs.—Carol Ellison



DisplayWrite Assistant is a pivotal product in IBM Corp.'s line of office applications, designed to link its *Assistant* office productivity series with its high-end corporate word processor, *DisplayWrite*. It is a capable personal and low-end corporate word-processing program, although it lacks mail-merge capabilities. It is equipped, however, with a spelling checker, a synonyms list that serves reasonably well as a thesaurus, and has the ability to draw lines.

It is easy to learn and good for generating letters, reports, and memos. Within IBM's product line it is supplanting *The*

Writing Assistant as the word processor best suited for small-business and internal corporate use. Virtually identical to *DisplayWrite Assistant* in capabilities and price, *The Writing Assistant* is marketed by IBM as a personal word processor.

The two programs borrow the "piece-of-paper" metaphor used in *PFS:Write*, a product no longer marketed by its maker, Software Publishing. Borders surround the screen and typed text appears within margins that are illustrated by blank space at the top, left, right, and bottom of the electronic "paper." The screen displays a ruler line that you can set to appear at the top or bottom, as well as two lines that contain messages indicating the name of the document, whether you are in insert mode, the line number and page number of your cursor position, and the size of the document. In addition, these lines show the operation of four critical function keys: F1 for help, F4 for block edit, F7 for format codes, and F10 for the spelling checker.

You install *DisplayWrite Assistant* using an install routine. If your system has a hard disk, the program creates a directory and copies files to it. If you are using dual floppy-disk drives, it formats a disk in the B: drive and copies files to the backup disk.

You type DWA to go directly to *DisplayWrite Assistant*, but if you wish, you can install the program to link to other programs in the *Assistant* series through a master menu. Using that installation, you highlight *DisplayWrite Assistant* and strike Enter to activate the program.

DisplayWrite Assistant comes up to a main menu that presents six options. If you choose Type or Edit, you are taken to a blank screen. You simply begin typing to create your document. At the main menu, you can also choose Define Defaults to set your margins and line spacing; Print; Get to retrieve a previously created document; Save, which lets you choose whether you want to save the document in *DisplayWrite Assistant* format, ASCII format, or Reversible Form Text (which can be read and edited using other components of the *DisplayWrite* series or *Assistant* series—*Filing Assistant*, *The Writing Assistant*, *Reporting Assistant*, *Planning Assistant*, *Graphing Assistant*, *Drawing Assistant*, and *Project Assistant*).

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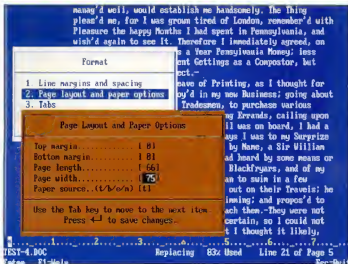
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Printer Stand \$19.95



DisplayWrite Assistant allows you to set defaults at the main menu and also to change formatting in the typing frame. This screen shot illustrates the pull-down menu that appears when you press F7 within the typing frame.

BLUE PRINTERS Like most of IBM's software, *DisplayWrite Assistant's* chief fault is its refusal to recognize printers that are not made by IBM: it supports IBM printers and only a few others. *DisplayWrite Assistant* has 16 printer tables, 10 for

horizontal spacing, and paper handling. The procedure is well laid out and not terribly difficult, but it is time-consuming and tedious—an unnecessary pain that most programs spare you by providing adequate printer support.

DisplayWrite Assistant's menus make it easy to learn, but you often have to go through several layers of menus to accomplish what you want. There are shortcut keys, such as F2 for quick save, that save you time. But after you learn the program, the menus can be an annoyance. There are no shortcuts for a number of features, and the menus just slow you down. For instance, block edits are invoked through a function key (F4), but text to be moved, copied, or deleted must still be defined by moving the cursor.

Another small annoyance is that some of the cursor movement keys, although identical to those found in *DisplayWrite 4*, deviate from conventions found in other programs. So if you come to this program from a non-IBM word processor, you'll have to get used to a few new routines. Alt-9 takes you to the beginning of the document; Ctrl-Home takes you to the top of

the current page. Ctrl-End takes you to the bottom of the page, but if you want to go to the end of the document, you must press Alt-0. Ctrl-PgUp doesn't take you up; it takes you to the left-hand margin. Similarly, Ctrl-PgDn doesn't take you down; it takes you to the right-hand margin.


DisplayWrite Assistant's spelling checker, invoked with the F10 key, lets you check individual words, as well as the entire document. When a misspelled word is found, you can ignore the word, ask for options for the correct word, type in a correction, or add the word to the dictionary. The synonyms list is also summoned with F10 and is used to check options on individual words.

Context-sensitive help is available with F1. Although the program does not come with a tutorial, the documentation is well organized and written in an easy-to-follow, step-by-step style. Rounding out the package are two 3½-inch disks containing the program that are included along with the three 5¼-inch program disks—handy if you have a laptop or plan to move up to one of IBM's PS/2 systems.


DisplayWrite Assistant is a good option for internal corporate communications—especially if you have an IBM printer, are already using the *Assistant* series, and need a word processor to link

DisplayWrite Assistant's spelling checker, invoked with the F10 key, lets you check words, as well as the entire document.

IBM printers. If your printer doesn't appear among those 16, you must create your own printer driver, using the program's Printer Description Utility. The utility is a menu-driven procedure that lets you define such printing characteristics as superscript and subscript settings, vertical and hori-



FACT FILE



DisplayWrite Assistant, Version 1.0
IBM Corp.
Old Orchard Rd.
Armonk, NY 10504
(800) 447-4700 (for dealer information)
List Price: \$195 (one-time license charge).

Requires: 256K RAM, two disk drives, DOS 2.1 or later.

In Short: Good for small office tasks, like writing letters and memos, but lacks mail-merge capabilities. The program has very little support for printers that are not IBM but it is easy to use. It can link with IBM's *Academy* word processor and its *Academy* with *IBM's DisplayWrite* series. Not copy protected (except when running under the *IBM Assistant* series Menu Manager).

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■ WORD PROCESSORS

with other applications in the series. Drivers for printers beyond the blue horizon would be a welcome addition.—Carol Ellison and Marcelline A. Barron

DisplayWrite 4

SUITABILITY TO TASK

Professional

Corporate

Personal

Legal

Desktop Publishing



IBM markets its \$495 DisplayWrite 4, Version 1.0, as a high-end word-processing program for the professional or casual user. This latest DisplayWrite version boasts an improved user interface, as well as more functionality than the very popular DisplayWrite 3. Even so, Big Blue has not yet managed to produce a truly state-of-the-art word processor comparable to Microsoft Word, WordPerfect, or XyWrite.

DisplayWrite 4's pull-down menus allow you to perform such tasks as creating documents, but you access most of the editing and character-formatting functions by using the Ctrl and Alt keys in combination with character or function keys. The assignment of these keys is sometimes mnemonic: Ctrl-U turns underlining on and off while you type, Ctrl-B does the same for boldface, and Ctrl-C centers text. But most key assignments are arbitrary and require you to either memorize them or refer to the template supplied: for example, Alt-8 erases text to the end of the line, and Alt-Y inserts a print code that moves the carriage up half a line.

Once you have learned which keystrokes do what, you have immediate access to most editing commands within the main typing area of the keyboard. The function keys are reserved primarily for global, nontyping commands such as setting document defaults or performing a spelling check.

Making selections from the menus will

often take you through several levels of submenus. Unfortunately, once you have made your choices, you must go back through each menu level to return to your document. Things would be easier if you could just drop out to the document after you're done with the menus.

WEAK PRINTER SUPPORT One problem with IBM software is that it acts as if products from competitors didn't exist. DisplayWrite 4 provides full printer support only for IBM printers (or printers that emulate them closely). If you should be unfortunate enough to own a non-IBM printer but wish to take full advantage of DisplayWrite 4's print functions, the documentation does contain material on developing your own printer configuration. However, it warns that "this section is intended for use by programmers, technicians or experts with an understanding of the technical information about printer support." Unless a user is willing to become one of the above, or to hire one, DisplayWrite 4 would prove impractical for anyone wishing to print documents on a product not from Big Blue.

This problem aside, the program does offer a number of useful features, includ-



FACT FILE



DisplayWrite 4, Version 1.0
IBM Corp.
Old Orchard Rd.
Armonk, NY 10504
(800) 447-4700 (for dealer information)
List Price: \$495

Requires: 384K RAM, two disk drives, DOS 2.1 or later.

In Short: DisplayWrite 4 is a capable word processor, but it lacks some of the features and refinements of other products in the same price range. Limited printer support. Not copy protected.

CIRCLE 84 ON READER SERVICE CARD

ing context-sensitive on-line help, a spelling checker (but no thesaurus), math capability, outlining, and cursor drawing. You can restore an accidentally deleted block of text. Another nice touch lets you use one layout menu to set the top margin of a document's first page differently from that of its succeeding pages. This is handy when printing the first page on letterhead.

A rather unusual feature is Display-

U.S. English | Ins | | Pg 6
Typestyle 26 (10p) | Ln 33

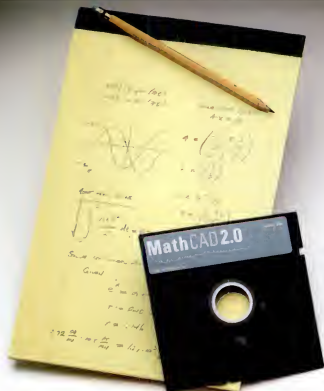
F2=End/Save F4=Block F5=Functions F6=Search F7=Format F8=Instructions

My Mother had likewise an excellent Constitution. She uckled all...
either my Father which they to buried together a Marble stone

By my rand self to be grown t one does not Ball. fit

To return. I contin'd thus employ'd in my Father's business for two Years, that is till I was 12 Years old; and my Brother John, who was bred to that Business having left my Father, married and set up for himself at Windsor, here was all Appearance that I was destin'd to supply his place and be a fellow thunder. But my Dislike to the Trade continuing, my Father was under Apprehensions that if he did not find one for me more agreeable, I should break away and

During a spelling-check session in DisplayWrite 4, all words that are suspect within the area specified for checking are highlighted. DisplayWrite 4 then offers a list of possible replacements.



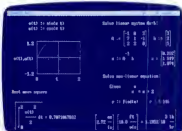
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MathCAD is more than an equation solver. Like a scratchpad, it allows you to add



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MathSoft, Inc., One Kendall Sq., Cambridge, MA 02139

■ WORD PROCESSORS

Write 4's Voice Note, which you can implement with the help of additional special hardware and software available from IBM, as well as a microphone and speaker. This feature lets you record spoken comments directly into a document and then play them back.

NEW FEATURES *DisplayWrite 4* has some new functions that current users of *DisplayWrite 3* should find welcome. One of these—called Paper Clip—lets you store a file and then retrieve it, returning the cursor to exactly the same spot it occupied when you left the document. This may not be useful for short memos but can be a big help with longer documents—no

DisplayWrite 4 offers a number of features, including context-sensitive on-line help, a spelling checker, math capability, outlining, and cursor drawing.

more scrolling from page to page looking for the spot you had been revising!

A feature available in more and more software programs is macro capability, which lets you record a sequence of keystrokes and assign it to a particular key for automatic execution. *DisplayWrite 4* allows you to create macros, but unfortunately it does so in a rather cumbersome and limited manner. First, you save a series of keystrokes to a file. Then, to use it, you must go to the menu to load the macro into memory; another menu selection plays it back for you. Worse still, only one macro can be used at a time.

DisplayWrite 4 does have power, flexibility, and a good number of the features you would expect from a high-end word-processing package. But compared with other word processors available in this price range, it falls short.

—William H. Stewart

Easy Extra

SUITABILITY TO TASK

Professional

Corporate

Personal

Legal

Desktop Publishing



Easy Extra, Version 1.5, is one in a series of word processing products from MicroPro International Corp., makers of *WordStar*. A \$99 package, it is designed for light users whether they be students or business folks. Other packages in the series are *WordStar Professional*, Release 4, for wordsmiths, and *WordStar 2000 Plus*, which in its latest release incorporates modules aimed at vertical markets such as legal. *Easy Extra* is for everybody else.

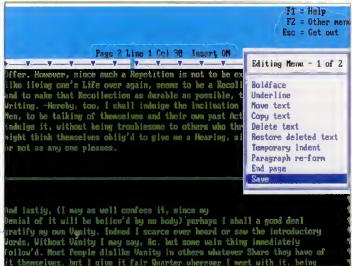
Easy Extra has tons of features for such an inexpensive package. It includes a spelling checker, a list manager, and lots of printer support. Most of all, it is easy to use. The documentation was written to be

understood, as opposed to being written in "computerese," and it has a disk-based tutorial. Even first-time hunt-and-peckers can be up and running in no time.

You should install *Easy Extra* on a hard disk. You can run it from floppies, but it gets clunky and cumbersome when you have to change disks to run the spelling checker or print a file. You'll need a minimum of 1.35MB of space on your hard disk, not counting what you'll need for text or data files.

Easy Extra is menu driven. There are menus to take you from setting up your printers (you can define up to three) to working on your first practice document. Menus tend to slow you down, and *Easy Extra*'s menus do respond slowly. But MicroPro took that into consideration, and you can make menu choices by scrolling a bar and hitting Enter or just by hitting the first letter of the menu selection.

Once into the editor, the cursor defaults to insert mode and moves along at a steady clip. The size of the file you can work on is set for 60 pages, and the program tells you "file full" when you exceed that limit. However, during the setup procedure when you install the program, you can adjust the limit from 40 to 255 pages.



Besides the normal typing keys, the only keys you'll use in *Easy Extra* are Esc, F1 for help, and F2 for the editing menu, shown here.

AS EASY AS 1-2-3 You need memorize only three keys to use *Easy Extra*—F1, F2, and Esc. Help is conveniently and appropriately located at F1, and although it's context sensitive, it is rather limited. Better and deeper help is available outside the editing screen in a help index that you access after saving your program and returning to the program's master menu.

The F2 key is the workhorse. When you press F2, a small editing menu pops out over the upper-right-hand portion of your screen. This lets you access the editing commands. Most edits are done in a marked block. You can copy, move, or delete text in a block. And if you get really good, you can customize *Easy Extra* to suppress the menu prompts and speed up the program. *Easy Extra* has a command for restoring deleted text that lets you bring back the most recent block of text you deleted. The program also uses block-definition editing to boldface and underline, and to create subscripts and superscripts.

The F2 menu helps you set tabs and margins, select different type or font styles, and do a search and replace. *Easy Extra* also has a spelling checker with an 87,000-word dictionary that automatically suggests a corrected spelling.

Easy Extra supports an enormous number of printers, including lasers. You can customize the page layout and put in a one-line header and a two-line footer. The pro-

gram displays page breaks. One thing I didn't like was my having to leave the editing screen to print a file. Offering a print command on the pop-up editing menu or adding an F key as a print-command key

would make things easier.

EasyMail is the list manager that comes in the package. It takes a straightforward approach to recordkeeping by giving you 23 unalterable predefined fields. Sorts can



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System requirements: IBM PC, AT, PS/2 or compatible, DOS 2.0 or later, 80 column display—color or mono, less than 35K RAM. Available on 3.5" disk.

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FACT FILE



Easy Extra, Version 1.5
MicroPro International Corp.
33 San Pablo Ave.
San Rafael, CA 94903
(800) 227-5609
(415) 492-1200
List Price: \$99

Requires: 256K RAM, two disk drives (third disk recommended), DOS 2.1 or later.

In Short: An inexpensive but versatile low-end word processor with a spelling checker and the same file format as *WordStar Professional*. It also has a list manager with mail-merge capabilities, strong printer support, and the ability to read 1-2-3 files. Not copy protected.

CIRCLE 696 ON READER SERVICE CARD

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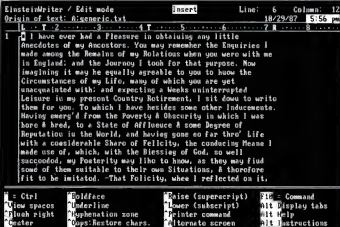
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■ WORD PROCESSORS

be done on 11 fields, and you can do searches using more than one variable. You can then produce form letters by doing mail-merge with any or all of the fields. EasyMail comes with predefined forms so you can print mailing labels one, two, or four across; envelopes; a telephone directory; or rotary cards. You can back up EasyMail files by writing them to an ASCII delimited file that could be read by another program, but, because of the fixed fields, you can't import into EasyMail.

All in all, *EasyExtra* has a lot going for it as a program for personal use. It is inexpensive, its editing features are powerful enough to create average-sized documents, and you get the EasyMail list manager and a spelling checker. What could be easier?—Patrick Nicholas



The edit screen for EinsteinWriter shows the margin and tab ruler line, position of the cursor, document being edited, optional instruction display, and time and date.

EinsteinWriter

SUITABILITY TO TASK

Professional



Corporate



Personal



Legal



Desktop Publishing



1 2 3 4

EinsteinWriter, by Perceptronics, is for users who need a straightforward word processor without sophisticated features. Listed at \$75 (including the spelling checker), it furnishes all the basic formatting, editing, file management, and printing features with on-line help and has the ability to convert its files into ASCII format for use by other programs.

EinsteinWriter won't let you construct an index, draw up a table of contents, do an outline, use desktop publishing features, do math, sort, or draw boxes, but it will let you find and replace text, adapt a model document to your use, undo and repeat commands, manipulate blocks of text, and write headers and footers as well as subscripts and superscripts. On-screen help is available; error handling is good.

From the main menu's options, you can

select the edit mode (for creating or editing documents) or the split-screen compose mode (for composing a document in a lower window based on a model displayed in the upper window).

A document such as a standard can serve as a model, or you can use an Einstein Model, which you can buy separately. These come in five groups costing \$19 each and cover common categories like business correspondence and letters for different occasions. You can paste any portion of the model into the document you are preparing.


VARIABLE LAYOUT MODE One choice from the main menu is the layout mode; this is used to specify the page layout regarding margins, tabs, line spacing, and print compression. Up to seven layout modes may be used in a document. You could use, for example, different margin settings and line spacings in different paragraphs of the same letter.

The print mode is another choice, and it lets you select the number of copies and specific pages to be printed to either the printer or a disk. To chain-print documents, a special file called a fileset has to be created; its function is to list all the documents to be printed. (They can reside in

different subdirectories or drives.)

Although more than 40 printers are supported, you cannot print directly from the disk to the printer. The document first must be pulled into memory for printing.


The file-handling mode lets you list, find, rename, delete, and save files, as well as erase current text. But unfortunately it does not let you temporarily exit to



FACT FILE

EinsteinWriter
Perceptronics Inc.
6271 Variel Ave.
Woodland Hills, CA
91367-3713
(818) 712-0045
List Price: \$75, including EinsteinSpeller; mail-merge is available separately for \$99.
Requires: 256K with EinsteinSpeller, two disk drives, DOS 2.1 or later.
In Short: Limited file size and features make this program unsuitable for sophisticated or heavy-duty tasks. However, the features it offers work well for standard use, and you can customize model documents. Not copy protected.
CALL OR WRITE FOR SERVICE CARD

The EinsteinWriter



After Our Engineers
Met Your
Demands For Price,
Performance
And Compatibility...



Power That Means Something Better for Everyone. The AST Premium/386 is a sigh of relief to users trying to decide whether to support IBM's vision of the future, or remain in the industry-standard world of compatible 80386 machines.

With 20 MHz, typical 0-1 wait-state operation, a 32-bit data path from CPU to memory and a fully arbitrated industry-standard bus, the AST Premium/386 is the first 80386-based, AT-compatible computer to provide the crucial multimaster functionality of IBM's Micro Channel™ architecture.

Multimaster Capability. AST's Multimaster Bus is a shared memory architecture that improves performance by eliminating CPU involvement in data transfers. Its ability to accommodate advanced coprocessor and multiprocessor architectures makes the AST Premium/386 the perfect solution for any application that can take advantage of intelligent coprocessors and controllers, such as backend database processing, intelligent graphics controllers for CAD/CAE/CAM or desktop publishing, and intelligent disk controllers for network file servers.

Bus Master Disk Controller. AST's Bus Master Disk Controller actually supervises the transfer of data from its memory across the bus to the system memory without involvement of the CPU or motherboard DMA devices.

In addition to providing ST506 or ESDI compatibility and optional disk caching, AST's intelligent disk controller can be optimized to provide overlapping operations for a multitasking environment.

The Most Compatible 80386 on the Market. Best of all, you can continue to run any of your existing DOS applications on the AST Premium/386, and also take advantage of the more advanced multitasking and multiuser operating systems such as Microsoft's® MS OS/2 and XENIX®.

The same compatibility is true with hard-

ware. AST Premium/386 operates with your current multifunction and data communications cards, as well as newer, more powerful board-level peripherals designed for AST's Multimaster Bus. The savings add up when you consider all of the existing software programs, enhancement boards, drives, monitors and keyboards you already own.

Intelligent Memory Management. Up to 2 MB of memory are standard, expandable to 13 MB. Which means you have all the memory you need to multitask applications using operating environment software such as Windows™ and DESQview™. Plus, more than enough memory to fulfill requirements of operating systems and applications in the future.

Continuing the Tradition of Unsurpassed Quality. AST customers know what to expect—the best in quality, and the best in value.

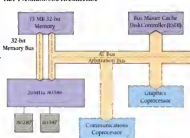
The AST Premium/386 is no exception. That means building a system using the most advanced technology, including ASIC and surface-mount components. And once it's built, test after painstaking test is conducted to prove that the AST Premium/386 deserves its name.

Support When You Need It, Wherever You Are.

AST's dedication to its customers is second to none. Even though AST's technical support team resolves 95 percent of all product problems by phone, on-site repair is available in 32 U.S. and 3 Canadian centers, with more planned.

AST: The One Best Source for All of Your Computing Needs. As the industry leader in enhancement products, AST provides a full line of the most reliable, high-performance memory, data communications and desktop publishing solutions available. And while our solutions are designed to strictly adhere to industry standards, customizing your AST Premium/386 with AST solutions ensures maximum compatibility right down to the component level.

AST Premium/386 Architecture



AST's Multimaster Bus technology allows direct access to main memory for faster overall system throughput

Inverted Foldout slip-sheet



GbaSlipSheet-001

Foldout slip-sheet

1. Open the foldout page
2. Insert this sheet with
 1. Front side touching the free page
 2. Arrow pointing to the fold
3. Slice the folded edge
4. Close the page and slip-sheet



1. Open the foldout page
2. Insert this sheet with
 1. Front side touching the free page
 2. Arrow pointing to the fold
3. Slice the folded edge
4. Close the page and slip-sheet



1. Follow instructions on the other side

Inverted Back



0bx51p@ack-0018

Back

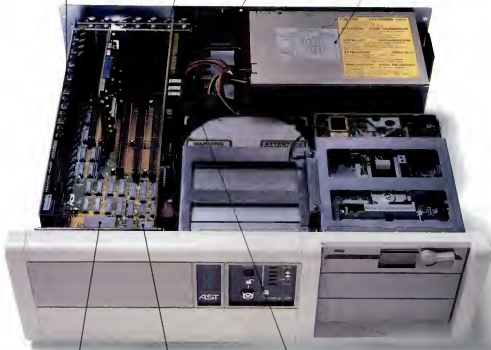
1. Follow instructions on the other side

32-bit memory board, upgradeable to 13 MB using SIMM modules ensures your investment in future operating systems and applications without requiring additional slots.

Multimaster Bus offers ability to run concurrent hardware tasks while remaining AT-compatible. Offers key features of IBM's Micro Channel while protecting current investment in AT bus standard.

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So, when the time came to see the results of their labor, we naturally expected a work of art.

What we got was a masterpiece.

Introducing the AST Premium/386—the first 20 MHz, 80386-based computer to offer advanced bus architecture without surrendering existing PC hardware compatibility. You no longer have to compromise anything for unprecedented speed and complete compatibility in a system built for the future.

Introducing The AST Premium/386.



MS OS/2 Compatible

The AST Premium/386 Is Just One Member Of Our Systems Family.

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And you may choose to use the Premium Workstation as a smart terminal attached to a minicomputer or mainframe.

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	AST Premium/386	AST Premium/286	AST Premium Workstation
Microprocessor	80386	80286	80286
Speed (MHz)	20†	10, 8, 6	10
Wait States	0-1	0	1
Standard Memory	Up to 2 MB	1 MB	1 MB
Expandable to	13 MB	13 MB	4 MB
Video Adapter	Optional	VGA/EGA/HGC (most models)	VGA/EGA/HGC module
Expansion Slots	7*	7**	2
Fixed Disk	40, 90, 150 MB	20, 40, 70 MB	40 MB
Diskette Size and Capacity	5¼", 1.2 MB 3½", 1.44 MB	5¼", 1.2 MB 3½", 1.44 MB	5¼", 1.2 MB 3½", 1.44 MB

†Three software selectable speeds for timing sensitive programs.

*One 12-bit dedicated to memory three 8-bit compatible 16-bit multibank and one 16-bit 8-bit compatible, and two 8-bit in standard models.

**One 8-bit, six 16-bit including 2 ESDI slots and four zero slots in standard models.

Please send me more information on the following:

- ☐ AST Premium/386
- ☐ AST Premium Workstation
- ☐ AST Premium/286
- ☐ Please have an AST representative call me.

Name _____

Title _____

Company _____

Address _____

City/State/Zip _____

Phone _____

AST Research, Inc. 2121 Alton Avenue, Irvine, Ca.
92714-4992 ATTN: M.C.

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AST
RESEARCH INC.

■ WORD PROCESSORS

DOS or back up any of your files.

You may attach a user comment to each file as it is saved; the program can then retrieve files based on strings in the comment. The comment I attached to this file, for instance, was "Review for PC Magazine." I was then able to retrieve the file just by entering "PC Magazine" as the clue. This can be a great help if you don't remember the name of the file but you do remember what it was about.

Commands are issued with various key combinations using the Ctrl and Alt keys as well as the function keys; the program also uses dot commands. It takes a while to get to know which key does what, but keyboard templates and the mnemonic design of most commands help. I felt quite comfortable with the program after only a short time.

Macros can be used to identify text for insertion in documents. However, as with *EinsteinWriter's* other features, its macros are not sophisticated. They speed retrieval of text but can perform no other function and are not saved when you exit the program.

The effects of some commands, such as underline and boldface, are displayed on the screen. And when the margins or line spacing is changed, text is reformatted automatically. Other commands, such as line spacing and subscripts, show up in print only.

EASY INSTALLATION Installation was quick and easy, though the manual does not tell you to set up a subdirectory on the hard disk. Without that, the program takes residence in your root directory.

Help is available, both as on-line text and as instructions displayed optionally with various screens. The help text, however, has no index and is not context sensitive to specific commands or functions. To find what you are after within each mode, you have to scroll through the entire text.

The help text of my copy of the program made a number of references to the Hebrew version of some commands and formats. I understand from the vendor that this is an error and does not normally appear in the English version.

EinsteinSpeller is a separate 75,000-word spelling checker. To use it, you must first exit *EinsteinWriter* and then call up

the document with EinsteinSpeller. It uses three dictionaries: a smaller one is loaded into memory for a quicker response, and a second, larger one is stored on the disk. In addition, you can choose to create a third one yourself. The spelling checker's features, however, are somewhat limited. For example, you can tell it to ignore a word once but not throughout the entire document.

The maximum file size that *EinsteinWriter* can handle for editing purposes is 60K, or about 30 pages; it clearly is not intended for heavy-duty word processing. There are no built-in column formats, no fonts, no multiple windows, and no graphing. *EinsteinWriter's* capabilities do manage to get the job done, but they are not designed to impress the advanced user.

—Claude Bartel

The Executive Footnoter

SUITABILITY TO TASK

Professional

Corporate

Personal

Legal

Desktop Publishing



Anyone who writes research papers will be rooting for *The Executive Footnoter*, a \$69.95 toolbox from John Risken & Associates. The program aims to help such people move between the boundless realm of research—university and library computer files, on-line databases, books, periodicals—and the little kingdom of the personal word processor.

By integrating a word processor, a database, and a terminal communications program, *The Executive Footnoter* enables a computer with 256K RAM and a Hayes-compatible modem to do research on-line, capture (or send) files, and organize information in a set of "electronic note cards." It also enables the computer user to out-line, write, and print a paper or report, in-

corporating note card entries and footnotes and automatically generating a table of contents, a bibliography, and an alphabetical index.

The Executive Footnoter is menu driven, and context-sensitive on-screen help is available throughout. Installing it on both floppy disk and hard disk drive systems is largely automatic and fully prompted. Documentation is good, even though it occasionally assumes user knowledge and glosses over important points, and technical support is responsive and genuinely helpful.

The word processor itself has two modes—typing and editing. In previous versions the editing functions (center, goto, mark, search, replace, justify, and so forth) and printing function were available only in the editing mode. With the advent of Version 6.0, these functions are available in the typing mode as Alt commands; nonetheless, switching between modes is so simple that most users will forgo the Alt options entirely.

Page and paragraph formats, document merges, footnotes, and entries for tables of contents and indexes are all specified by prescribed commands that you must embed in the text. Users accustomed to one-keystroke commands, hidden codes, and WYSIWYG might find *The Executive Footnoter's* text display nightmarishly hieroglyphic. But the command structure is straightforward, easy to learn, and more acceptable when you realize that it is, at least partly the result of avoiding the use of any function keys but F1 (help).

The other function keys are reserved for special features of the audio-synthesized version of the program, which is available at no extra cost to sight-impaired computer users. These features (spelling of individual words and reading of words or lines of text) require that the host computer be equipped with a voice synthesizer.

Because of the embedded commands, you cannot view a document in its final form until it is printed, either on paper or to disk. You can edit the text on the printer file, but you can add or modify codes only in the original document file. A two-level table of contents is generated automatically during printing, as is an alphabetical index (if the \$20 indexing add-on is purchased as part of the package—a

■ WORD PROCESSORS

```

up and down arrows move between fields. PgUp and PgDn move between
cards. ALT-d deletes card, ALT-y prints it. ALT-C clears the first ten
fields. (ESC) to quit.
CARD NUMBER 2
NOBYDICK 5 cards, max: 2999
579 characters left
1 Herman Melville
2 Moby Dick, or The White Whale
3 Chapter 95
4 1949
5 Literary Guild of America
6 Garden City, New York
7 Novel
8 The intense _fogued_ sailed on: the rolling waves and days went by: the
9 life-busy coffin still tightly swung; and another ship, most miserably
10 misnamed the _Delight_, was descried...Upon the stranger's shears were
11 beheld the shattered, white ribs, and some few splintered planks, of
12 what had once been a whale-boat...
13 irony, imagery
14

```

The Executive Footnoter's optional Electronic Note-Card System is a database fashioned on the traditional academic note-card format. Records can be sorted, and information from any field or combination of fields can be inserted in text and footnotes.

worthwhile investment).

The print driver menu lists 15 of the most widely used printers, including Epson, Imagewriter, Okidata, and the HP LaserJet, plus a "general printer" driver. You use a menu to specify the print format

words and blocks of text separately from the rest of the document.

The optional terminal communications program is simple and straightforward. It features manual or automatic dialing (from auto-log-on scripts), capturing to files, and answering incoming calls from other terminals, and it supports baud rates up to 1,200.

CAPABLE, WITHIN LIMITS The feature most likely to warm the hearts of students and other academicians is *The Executive Footnoter's* electronic note-card system, a prestructured database in which records follow the traditional note-card format. Among each record's 14 fields are Title, Author, Publisher, Publication Date, Page, Keywords, and a Notes section. You can carry over bibliographical information from one "card" to the next, eliminating considerable rekeying. You can search and sort by individual fields or combinations of fields by using *and* or *or*, and the program can generate a bibliography from the records.

Although you cannot alter field sizes and headings, you can use the database to

generate mailing lists and perform mail-merge functions. You simply ignore the field titles and enter names, addresses, telephone numbers, and so forth in place of authors, titles, and publication dates.

The Executive Footnoter's biggest drawback is its inability to handle files larger than 24K—a consequence of its limited RAM-addressing capability. You can work around this limitation by creating large documents piecemeal in multiple subfiles and merging them during printing. This method allows a document of unlimited size, but not one that can be edited as a whole. The vendor plans to introduce a version based on a larger-memory model—a far more acceptable solution to the RAM problem.


In addition, the program cannot import data captured through the terminal communications program directly into the electronic note-card system. To use sections of a captured data file in different parts of a term paper, you must assign each section to a different file and merge the files into the main document when you actually print it.

Despite its limitations, *The Executive Footnoter* is a practical set of tools for streamlining the drudgery of researching and writing formal papers and reports. Without the four optional add-ons, howev-

Executive Footnoter's spelling checker is limited but flexible and easy to modify.


for each document, and you incorporate the required codes in the text to invoke special features that your printer supports.

The optional, 24,500-word spelling checker is limited but flexible and easy to modify. You can add words on the fly during a document spelling check, and you can modify the lexicon from a spelling list management menu. Unfortunately, you cannot check the spelling of individual



FACT FILE

The Executive Footnoter, Version 6.0
John Rinken & Associates
P.O. Box 24045
Minneapolis, MN 55424
(612) 920-7235
List Price: \$69.95; add-ons, \$20 each; upgrade from Version 5.0 or earlier, \$30 (includes add-ons).



The Executive Footnoter™ Software For Publishing Formal Papers

Requires: 256K RAM, one disk drive, DOS 2.0 or later.

In Short: Specialized software for researching and writing formal papers, this program automatically generates tables of contents and footnotes. Optional add-ons include an electronic note-card system, spelling checker, alphabetical indexing program, and terminal communications package. Not copy protected.

CIRCLE 000 ON READER SERVICE CARD

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ProPrinter XL**

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pages***

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CIRCLE 129 ON READER SERVICE CARD

■ WORD PROCESSORS

er, the program loses its special appeal. So plan to invest \$149.95 if you want to use *The Executive Footnote* to its full capacity.—Robert Ausura

The Executive Secretary

SUITABILITY TO TASK

Professional

Corporate

Personal

Legal

Desktop Publishing



The Executive Secretary, Release 6, is an ambitious attempt by John Risken & Associates at a full-featured word processor that falls uncomfortably short of the mark. Offering word processing, mail-merge, and database capabilities, as well as indexing and limited communications, the \$159.95 program is difficult to learn primarily because the documentation is very poor.

The installation procedure, for example, instructs the user to "start up your computer by putting your DOS disk in drive A: and pressing Enter. Once the A: prompt appears on your screen, put our disk in drive A:, type install, and press Enter." The poor novice will be bewildered at the dormant state of the computer before even beginning.

If the user is computer literate enough to know how to boot the system, he will be thrown by the subsequent instructions, which are not synchronized with the true sequence of events. The manual instructs you to preformat diskettes through the "Use other features" and "Set up document disk" submenus. When these choices are executed, you get "General failure reading drive B. Abort, Retry, or Ignore?"

LOSS OF CONFIDENCE Such a lack of attention to important details in the manual does not instill a lot of confidence in the package as a whole. These doubts were

later confirmed by my attempt at following a "guided tour" of the package that simply didn't work. Specifically, when following the example of merging the card file with a document, the print procedure resulted in a confused printer, stuck at the >M1 command, unable to continue. Another example, the illustration of the window command, instructs you to enter a left-edge command though the software has no facility to do so.

Exiting a file is a multiple-step procedure, even when you don't wish to save your changes. Very large files cannot be accommodated in one logical file. You must first set up subfiles (which must all exist on the same diskette or subdirectory) and then include the subfiles via embedded on-screen commands in the main file.

And on a document-wide basis, boldface and underlining are mutually exclusive. Not only can't the same word be both underlined and boldfaced, but the two highlighting techniques cannot coexist in the same document. In general, formatting is control code oriented rather than menu driven.

The spelling lexicon works fairly quickly; its dictionary, however, is very limited. Although you are able to add



FACT FILE



The Executive Secretary, Release 6
John Risken &
Associates
P.O. Box 24045
Minneapolis, MN 55424
(612) 920-7235
List Price: \$159.95

Requires: 256K RAM, one disk drive, DOS 2.0 or later.

In Short: This package contains several nice features, but the software and the documentation are not polished enough to be reliable. Not copy protected.

Circle 68 on Reader Service Card

words to the lexicon, it is a time-consuming and annoying process.

The manual comes in two parts. The first—the main user manual—is the original manual that came with Release 5. The second part is the supplementary manual for Release 6; it describes the enhancements and changes to Release 5. Both manuals are poorly written and are replete with useless nuggets of editorializing, such as the following "Insight": "Hyphenation

about 8 words left, LINDS 48-68 a:GENERIC TXT
HELP ADD CMTR DEL GJO LMSRT JUST LEX NJOE PJRNT RPLC SIGH X) - ESC)
he exercis'd towards me in continuing that Happiness, or in enabling me to
bear a fatal Reverson, which I may experience as others have done, the
Complexion of my future Fortune being known to him only: and in whose Power it
is to bless to us even our Afflictions.

The Notes one of my Uncles (who had the same kind of Curiosity in
collecting Family Anecdotes) once put into my Hands, furnish'd me with several
Particulars, relating to our Ancestors. From those Notes I learnt that the
Family had liv'd in the same Village, Ecton in Northamptonshire, for 300
Years, & how much longer he knew not, (perhaps from the Time when the Name
Franklin that before was the Name of an Order of People, was assum'd by them
for a Surname, when others took Surnames all over the Kingdom.-*) on a
Freehold of about 38 Acres, alied by the Seith's Business which had continued
in the Family till his Time, the eldest Son being always bred to that
Business. A Custom which he & my Father both followed as to their eldest Sons.
-When I search'd the Register at Ecton, I found an Account of their Births,
Marriages and Burials, from the Year 1555 only, there being no Register kept
in that Parish at any time preceding.-By that Register I perceiv'd that I was
the youngest Son of the youngest Son for 5 Generations back. My Grandfather
Thomas, who was born in 1598, lived at Ecton till he grew too old to follow
Business longer, when he went to live with his Son John, a Dyer at Banbury in
Oxfordshire, with whom my Father serv'd an Apprenticeship. There my

The one-line menu in *The Executive Secretary's* edit mode is fairly extensive and useful, although the C)NTR D)EL looks like two separate command choices rather than the intended C)NTR-DEL.

Insist on a Sysgen 5 $\frac{1}{4}$ " drive for your PS/2.

Here's why:

A Sysgen™ Bridge-File™ gives a PS/2™ full access to your current data and software, with unparalleled 5 $\frac{1}{4}$ " disk drive performance and reliability. You get:

A larger capacity drive. Two modes — a 360Kb and a powerful 1.2 Mb — assure you comprehensive transfer capabilities and convenience for total office needs. Others, like IBM's, offer only 360Kb. **Proven reliability.** In fact, Sysgen is the choice of over 100,000 satisfied Bridge-

File and tape back-up users. **No slot loss.**

The Sysgen 5 $\frac{1}{4}$ " drive adapter card doesn't take any additional slot space. IBM's does. **Built-in flexibility of an external connector.**

You can add another Bridge-File drive or Sysgen's high-performance tape back-up system, Bridge-Tape.™ (As a Bridge-File owner, you receive a total savings of \$135 on Bridge-Tape!) **What's more,**

Sysgen's footprint is smaller. A full 50% smaller than IBM's. For the best PS/2 access to 5 $\frac{1}{4}$ " disks, and the best value at only \$325, insist on Sysgen Bridge-File.

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■ WORD PROCESSORS

rules are too complicated for many humans and are certainly too complicated for computers." This note precedes the requirement to indicate acceptable spots for hyphenation manually.

ELUSIVE TECHNICAL SUPPORT

The program's technical support team consists of the author (John Risken) alone. The phone numbers listed in the main user manual are incorrect, and it took me 3 days and several more calls to track down the author. (However, his number is listed in the supplementary manual.)

Once I reached him, John Risken was very helpful and patient. Also, he was

Release 6 of Executive Secretary is a marked improvement over Release 5, especially in speed.

quick to research and correct the bugs that I asked about.

Release 6 is a marked improvement over Release 5, primarily in terms of speed, because it was rewritten from BASIC to C. The single-line menu in the editing mode is more extensive and helpful; another added benefit is the on-screen context-sensitive help. Also a special synthesized audio version of the software is available for the visually handicapped.

The *Executive Secretary* includes some other useful features that you wouldn't expect in a package of this class. The short-hand capability allows you to set up abbreviations for frequently typed words or phrases. A binding command instructs the printer to leave additional space beyond the specified margin on alternating sides—and to rotate page number placement for odd- and even-numbered pages—so that documents can be neatly inserted into binders.

However, the lack of consistency between *The Executive Secretary's* software and its instructions makes it inconvenient and frustrating for the user. There are better deals for \$159.95. —Susan Davis

Executive Writer

SUITABILITY TO TASK

Professional

Corporate

Personal

Legal

Desktop Publishing



Paperback Software International's *Executive Writer* is a \$69.95 program with built-in limitations, but it does a good job within those limits and is generally adequate. A standalone word processor, it has no spelling checker or thesaurus facilities. And it has no support for DOS paths, which means that multiple users will have a hard time organizing their data efficiently. On the plus side, footnoting and section-numbering features allow you to use *Executive Writer* for much more than mere letter writing.

Like other products in the Paperback Software line, the low-priced *Executive*

Writer package consists of one floppy disk inside a slim manual. Floppy disk installation is straightforward, though hard disk users must refer to a special appendix in the manual and perform a number of DOS commands. Each data subdirectory must contain certain *Executive Writer* files, thus wasting disk space. Also, the printer configuration program alters the DOS path—an undesirable program trait.

The well-written manual has plenty of illustrations and examples, but it's occasionally confusing. The glossary is a respectable bonus for beginners, though. Several pages of the book are dedicated to troubleshooting printer problems. The best feature of the manual is its brevity—about 100 pages, including the 30-page Quick Course, which is enough to get the program doing most everything.

The one and only *Executive Writer* menu is streamlined to four choices: Edit, Print, Display a DOS Directory, or Quit. Unfortunately, the filenames do not remain on the screen after you view the directory, so you must remember the name of an existing file and type in its name before editing it.

Once in the editor, you can access most

Editing: Old File test

I have ever had a Pleasure in obtaining any little Anecdotes of my Ancestors. You may remember the Enquiries I made among the Remains of my Relations when you were with me in England; and the Journey I took for that purpose. Now imagining it may be equally agreeable to you to know the Circumstances of my Life, many of which you are yet unacquainted with; and expecting a Weeks uninterrupted Leisure in my present Country Retirement, I sit down to write! (1) then for you. To which I have besides some other inducements. 4

1. *Executive Writer* uses "feather" commands to send special formatting instructions to the printer. The lines in this footnote were preceded with one such command. 4

Having emerg'd from the Poverty & Obscurity in which I was born & bred, to a State of Affluence & some Degree of Reputation in the

Insert On Document On Boldface Off Underline Off
 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100. 101. 102. 103. 104. 105. 106. 107. 108. 109. 110. 111. 112. 113. 114. 115. 116. 117. 118. 119. 120. 121. 122. 123. 124. 125. 126. 127. 128. 129. 130. 131. 132. 133. 134. 135. 136. 137. 138. 139. 140. 141. 142. 143. 144. 145. 146. 147. 148. 149. 150. 151. 152. 153. 154. 155. 156. 157. 158. 159. 160. 161. 162. 163. 164. 165. 166. 167. 168. 169. 170. 171. 172. 173. 174. 175. 176. 177. 178. 179. 180. 181. 182. 183. 184. 185. 186. 187. 188. 189. 190. 191. 192. 193. 194. 195. 196. 197. 198. 199. 200. 201. 202. 203. 204. 205. 206. 207. 208. 209. 210. 211. 212. 213. 214. 215. 216. 217. 218. 219. 220. 221. 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1848. 1849. 1850. 1851. 1852. 1853. 1854. 1855. 1856. 1857. 1858. 1859. 1860. 1861. 1862. 1863. 1864. 1865. 1866. 1867. 1868. 1869. 1870. 1871. 1872. 1873. 1874. 1875. 1876. 1877.

functions with the function keys. A display along the bottom row of the screen serves as a reminder of what each function key does. It changes when you depress Shift, Alt, or Ctrl keys, letting you see the meaning of the function keys when they are combined with one of these.

When you press F1 for on-screen help, *Executive Writer* asks you to hit the key for which you need help. A full-screen display provides information on the use of that key and related keys.

SNAPPY EDITING The program's editing screen is simple and well designed. It has a fast, snappy feel when you're paging through text. The current filename appears at the top, while status, tab, margin, and function-key settings always appear at the bottom. The current row and column, however, are not displayed; you also have no way of determining where page breaks fall in a document, short of printing it.

Unshifted, the function keys control the formatting of text both on the screen and sent to the printer. They allow you to alter page layout and margins and center lines. Two keys control boldface and underline modes; the status line indicates whether these modes are on or off. Boldface and underline are displayed as such on a monochrome screen.

Function keys used together with the Ctrl key handle the program's block copy, move, and delete functions. You can undelete a block, as well as change the print

attributes of a marked block to boldface, underline, or both.

Function keys pressed in combination with the Shift key access the search functions. Searching and replacing of text may be done backward and forward. The wild-card implementation for searches is handy though not comprehensive. A special symbol traps all occurrences of separator characters like spaces or punctuation marks. Another symbol finds combinations of two words separated by any number of blanks, including none.

Executive Writer loads and saves files to disk fairly briskly. You use combinations of function keys and the Alt key to issue file commands like save, update, or abandon. You can display a file directory and insert a text file from disk into the current document. And *Executive Writer* gives you a one-key command for previewing graphics files that you want to include in your printed document.

You send special instructions to the printer by way of "feather" commands embedded in the text. You enter the feather symbol on a line by itself, using a function key followed by a two-letter code indicating its purpose, such as "pa" for a forced page break. You can use these commands to indicate headers, footers, footnotes, conditional page breaks, and widow and orphan control settings. They can control most printer functions like page length and line spacing, or send nonprinting characters that typically access unique printer capabilities.

USEFUL VARIABLES Headers and footers may be left, right, or center justified, or any combination of these. The program supports even-page headers and footers, in which flush-left and flush-right text are reversed on alternating pages. Four special variables allow you to include the current page number, date, time, or filename. You can also set, increment, decrement, and display six counter variables anywhere in text, headers, or footers. These variables are useful for handling footnotes, as well as for automatic section-numbering schemes ("Section 3.4.2" and the like).

Executive Writer has an indexing feature that is workable but not fancy. You designate a separate DOS file for indexes

NUMBER



IN FULL TEXT RETRIEVAL

Search 5000+ text files in 5 seconds

Find any information created by all the popular word processors or ASCII files in seconds

• Comprehensive Searches

Create a search request with any combination of AND, OR, NOT and WITHIN (WITHIN refers to proximity). Scan a 20 Megabyte hard disk in seconds. Save hours of manual searching. Works with public data bases like Dow Jones and CompuServe as well as other programs such as LOTUS 1-2-3.

• Wild Cards

- Mark and Save
- On Line Help Menus
- Highlights
- Phrase Search

"A Word Crunchers Dream"

—PC Magazine June '87

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CIRCLE 316 ON READER SERVICE CARD

FACT FILE

Executive Writer,
Version 1.0
Paperback Software
International
2830 Ninth St
Berkeley, CA 94710
(800) 255-3242
List Price: \$69.95

Requires: 128K RAM, one disk drive, DOS 2.0 or later.

In Short: Some nice features like footnoting and section numbering, but no support for DOS paths. Copy protected, but manual includes a procedure that voids copy protection.

CIRCLE 658 ON READER SERVICE CARD

■ WORD PROCESSORS

with a feather command at the beginning of the document. The program then writes all subsequent index commands and their associated text to that file during printing, sorted in page-number order.

You can insert BSAVE-format graphics images in your text. The memory-resident "screen-grabber" program lets you incorporate graphics screens from other programs in the correct format. But you cannot crop images or position them (as in desktop publishing), other than by indicating which text line they should follow.

Executive Writer protects you from making serious mistakes. Error handling is sufficient, though not always illuminating. In general, the program works well and has many of the features of heavyweight word processors, without the high price or the intimidation. —David L. Hoffman

```
Page: 1      Line: 12 down TEST      Spacing: 1      COMMAND
ADD MARKER (8-277)      MARKERS: ABC E L R 2

I have ever had a Pleasure in obtaining any little Anecdotes
of my Ancestors. You may remember the Enquiries I made among
the Remains of my Relations when you were with me in England;
and the Journey I took for that purpose. Now imagining it
may be equally agreeable to you to know the Circumstances of
my Life, many of which you are yet unacquainted with; and
expecting a Weeks uninterrupted Leisure in my present Country
Retirement, I sit down to write them for you. To which I have
besides some other Inducements. Having emerg'd from the
Poverty & Obscurity in which I was born & bred, to a State of
Affluence & some Degree of Reputation in the World, and
having gone so far thro' Life with a considerable Share of
Felicity, the conducting Means I made use of, which, with the
Blessing of God, so well succeeded, my Posterity may like to
know, as they may find some of them suitable to their own
Situations, & therefore fit to be imitated. -That Felicity,
when I reflected on it, has induc'd me sometimes to say, that
were it offer'd to my Choice, I should have no Objection to a
Repetition of the same Life from Its Beginning, only asking
the Advantage Authors have in a second Edition to correct
some Faults of the first. So would I if I might, besides cure
the Faults, change some sinister Accidents & Events of it for
others more favourable, but tho' this were desir'd, I should
```

Final Draft has a simple but effective search-and-replace function that is accessed in document mode. The dark-blue, green, and light-blue letters indicate underlined, bold, and combined underlined/bold text, respectively.

Final Draft

SUITABILITY TO TASK

Professional
Corporate
Personal
Legal
Desktop Publishing



Final Draft is the quintessential yuppie program. It is slick, hard-working, and contains a number of features that are usually found in more-complex word processors. But it stops short of allowing you to take full advantage of those features. You might say that it is afraid of commitment.

For example, *Final Draft* includes a thesaurus that offers a wide selection of synonyms and antonyms, but it does not substitute the words automatically into the text. It has an efficient and comprehensive spelling checker that offers case-sensitive replacement, but it will not ignore unique words that you may use throughout a document. And it has a handy red-lining feature that only shows up on the hard-copy document.

Final Draft, from CYMA/McGraw-

Hill, lists for \$195. At first glance, it is a clear-cut, easy-to-understand program. It opens with a menu that offers the choice of editing a file or of choosing a previously saved file (*Final Draft* recognizes only files that it has created and given the extension of .CWD). You can also restore a backup file, print, do a spelling check, create a table of contents, delete a file, or change your document drive designation. Once you've named the document you wish to work on, you're dropped immediately into the editing screen. All pertinent information is given clearly across the top of the screen, including a ruler line, page and line numbers, and enough explanatory labeling to make the help function almost unnecessary.

The program's dual personality becomes evident as soon as you begin working with your file. *Final Draft* splits the editing process into two distinct modes: command, where almost all formatting commands are executed, and insert, where all text is entered. Although there are a few commands using the Ctrl key that can be executed in insert mode (including center-

ing, hard page break, line spacing, and indent markers), all other functions (including search and replace, boldface and underline, and all block functions) are done in command mode using mnemonic single-key commands. For example, hitting H will bring up the single help screen,



FACT FILE



Final Draft
CYMA/McGraw-Hill
1400 E. Southern
Tempe, AZ 85282
(800) 292-2962
(602) 831-2607
List Price: \$195

Requires: 128K without thesaurus, 256K with thesaurus, two disk drives or one disk drive and hard disk; DOS 2.0 or later

In Short: Comprehensive and easy to learn, the program is made cumbersome by its two modes: one for entering text, another for formatting. Not copy protected.

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CIRCLE 211 ON READER SERVICE CARD

■ WORD PROCESSORS

F will let you find text, and S (for Substitute Text) will access the search-and-replace function.

This method of separating typing and editing functions seems awkward; despite an on-screen message, I was constantly forgetting which mode I was in. Repeatedly, I needlessly typed letters in insert mode in an effort to execute a command, or I set a command into motion when I tried to type a sentence in command mode.

HOP-SCOTCH EDITING Jumping back and forth between modes also considerably slows the user's speed. This is a pity, because otherwise *Final Draft* performs with admirable speed and handles large files with little or no trouble.

Final Draft's method of defining blocks of text is efficient but problematic. You mark the beginning and end of your block with single-letter markers (a few blocks are preassigned, such as B and E,

which mark the beginning and end of the file). There are certain advantages to this method: it is easy to mark multiple blocks using different alphabetical tags. However, *Final Draft* doesn't define the block with highlighting or in-text markings; and, while the letters that are used as markers are displayed at the top right of the screen every time you invoke the Add Marker command, it's up to you to remember what those letters are marking.

Not surprisingly, you must go to command mode in order to copy, kill, or move a block of text. Although there is no true undo feature, immediately after executing the kill you are given the option of restoring the text. Once you have left the function, however, the phrase is wiped from memory.

Final Draft uses both automatic and manual formatting techniques. While you're in insert mode, the text will not automatically format (although inserted

text will wrap when you reach the end of the line), move the cursor to another line, or leave insert mode. Once in command mode, you can manually format the text by hitting N for New Format (well, mnemonics does have its limits).

Once you're ready to print, *Final Draft* provides a comprehensive menu of such options as number of copies, draft or enhanced type, and mail-merge. It also offers to print line numbers and red-line marks, both of which should be very welcome in, say, a law office. However, basic print enhancements are limited to boldface and underline, although users can assign additional enhancements to the function keys; two of those, superscript and subscript, are already assigned to the F1 and F2 function keys, respectively.

If you have problems with *Final Draft*, CYMA/McGraw-Hill's documentation suggests that you first talk to your dealer (obviously under the impression that most

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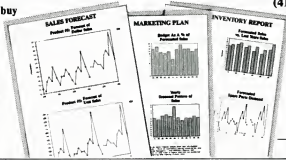
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CIRCLE 486 ON READER SERVICE CARD

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WORD PROCESSORS

dealers are familiar with the software packages they sell) or to a consultant. If neither of those is an appropriate outlet, the company provides an 800 hotline, for which the user is charged \$1.20 a minute with a \$10 minimum. Callers to the hotline should expect to leave their phone numbers; call-back time averaged between 1 and 2 hours.

A year after its inception, *Final Draft* is still a program with a great deal of potential, but its limitations hold it back. Its method of handling edit commands (forcing users to constantly switch between command and insert modes) is awkward, and its print choices are a bit limited.—Barbara Krasnoff

Final Word II

SUITABILITY TO TASK

Professional

Corporate

Personal

Legal

Desktop Publishing



Final Word II, Version 2.2, is not for the faint-hearted neophyte. This \$395 package, released in October by FW Corp., is designed for the professional and technical market. The cover of the raised-letter binder says it all: "The word processor of choice for serious writers and thinkers. . . . A powerful tool with multilevel editing, versatile formatting. . . ." This is one case where you can judge a book by its cover.

Software power and difficulty are always directly related, and *Final Word II* is no exception. At first glance, *Final Word II* will overload even the most experienced user. You won't find such popular features as WYSIWYG that easy-to-use packages offer. Spend a couple of hours with the program, though, and you'll find that everything starts to make sense.

Setup and installation are simple with a batch program. However, to set up unique

I have over had a Pleasure in obtaining any little Anecdotes of my Ancestors. And now I speak of thanking God, I desire with all Humility to acknowledge, to The Notes one of my Uncles (who had the same kind of Curiosity in collecting

He had form'd a Shorthand of his own, which he taught me, but never practicing it. This obscure Family of ours was early in the Reformation, and continu'd Protest Josiah, my Father, married young, and carried his Wife with three Children and My Mother the 2 Wife was Abiah Folger, a Daughter of Peter Folger, one of the

My elder Brothers were all put Apprentices to different Trades. I was put to the I think you may like to know something of his Person & Character. He had an eye My Mother had likewise an excellent Constitution. She such--Available Menus--



This shows *Final Word II*'s standard full-screen editing mode. You request the main menu by pressing Ctrl-X. A submenu is also shown, along with the standard one-line information bar at the bottom.

features of the program, you have to make adjustments to the DEFAULT.FWL file, which you edit in *Final Word II*. For example, if you desire certain screen colors, you change the screen color line in the DEFAULT.FWL file to "pa 02H,sa 20H,ia 2AH,ea A0H".

The DEFAULT.FWL file also changes other program functions, such as how fast the menus pop up and backup procedures. Fortunately, there are built-in defaults within DEFAULT.FWL, including backup safety measures. After a specified amount of time of no keyboard activity, *Final Word II* automatically backs up all current work. As an extra precaution, the program reminds you to close all open files before quitting.

The menus are logical. For example, a Ctrl-X represents extended menus; Ctrl-D plus a cursor movement is the deletion function. There is extensive use of the function keys, which you can change. However, there are no templates such as those in *WordPerfect* to overlay on the function keys.

Commands prefixed with @ and embedded within the text enable most of Fi-

nal *Word II*'s features. The @ commands drive the typesfaces, layouts, notes, references, chapters, and divisions within the document. To simplify and speed up operations, you can use macros and standard formatting files that contain the @ commands. For example, macros can create multilevel footnotes within the same page.

Final Word II has a convenient split-

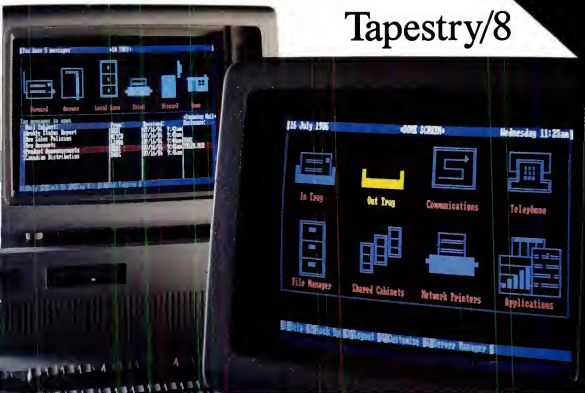
FACT FILE

Final Word II,
Version 2.2
FW Corp.
P. O. Box 443
Cambridge, MA 02142
(617) 489-5078
List Price: \$395
Requires: 256K RAM,
two disk drives, DOS 2.0 or later.

In Short: A powerful, flexible word processor with many features for technical and professional writers. The program has a high learning curve; it is not for first-time users. Not copy protected.

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■ WORD PROCESSORS

screen ability. You can work on up to six different files simultaneously, and you can merge files while the screen is split.

The vendor took great pains to configure *Final Word II* to almost any printer currently on the market, from daisy wheel to dot matrix to advanced laser printers. To print, you must properly configure the printer and use the @ commands correctly. Once you do so, *Final Word II* will bring out the best in your printer. The program offers an on-screen print preview so that you can look at your document before you waste any time on a hard copy.

The vendor took great pains to configure Final Word II to almost any printer currently on the market, from daisy wheel to dot matrix to advanced laser printers.

The manual has an anomaly: *Final Word II* prides itself on its referencing capability—that is, indexing and table of contents—but has poor referencing in its manual's index. There was more than one instance of the index differing from the actual content of the manual by one page. A representative at FW Corp. acknowledged this and said that it was corrected with Version 2.01, but unfortunately Version 2.0 was used to print the manual, so the problem remained. A new manual will be available with Version 2.2. The program does not come with tutorial lessons or disks.

Final Word II is not perfect. When tested, the program was a bit slow to load on an 8088 processor, but was quick when running. Printing can also be time-consuming with this program. Still, *Final Word II* is a powerful and flexible word processor for professional and technical writers. It may take you awhile to learn how to use it fully, but it is well worth the time.—Wayne Harding

FriendlyWare

SUITABILITY TO TASK

Professional



Corporate



Personal



Legal



Desktop Publishing



1 2 3 4

FriendlyWare is an inexpensive (\$49.95) program sold as a word processor (*FriendlyWriter*) and spelling checker (*FriendlySpeller*) rolled into one. It is an easy-to-use personal word processor, ideal for the writer or secretary who needs documents that do not require extensive formatting. Its menus and on-line help screens let you get started quickly.

FriendlyWriter's installation is easy. Its defaults are readily changed using the on-screen menus and three context lines at the top of the screen. The top two lines contain the command menu and show the current status and function of each command key (F1 to F10). The third line shows current

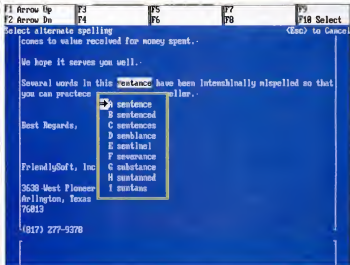
instructions and information such as current page, line, character, lines left on the page, and lines free in the letter.

SIMPLE CHOICES *FriendlyWriter's* opening menu asks if you want to write a new letter, select a letter on file for editing, choose on-line help, or exit to DOS.

To create a new letter, you simply type the letter and choose the reformat selection if the default settings are not appropriate. Choices are limited but sufficient for any letter not requiring tabular or scientific material. Saving the letter to disk requires a single keystroke once you type a descriptive name for your letter (up to 25 characters).

FriendlyWriter has a useful feature allowing you to search for a particular word or group of words from your list of descriptive names in the directory of letters. Once you have made your selection, the screen displays all the letters containing the search characters. You could easily set up your own filing system.

The usual text entry functions such as underlining, moving and copying text, inserting, and deleting are there. You can use only one tab setting, five spaces, which show up as five periods. The tab set-



FriendlyWare's spelling checker contains 70,000 words and allows easy correction, accomplished by choosing one of the alternative selections.



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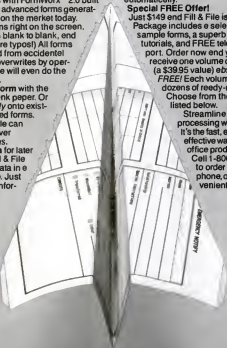
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■ WORD PROCESSORS

ting begins at the cursor point. The cursor was uneven and jumpy when backspacing. The screen appearance is unusual in that two vertical lines appear at the left and right margins, indicating page appearance. Justification appears on-screen if you have chosen Justify from the reformat menu.

The spelling checker, FriendlySpeller, counts the number of words and unique words and displays them on the screen; it then displays the characters of the alphabet as it checks each word in the document against a 70,000-word dictionary designed to find words most likely to appear in personal or business letters. Proper names, computer terms, and other "modern" words have replaced the seldom-used words found in other dictionaries. Each word is highlighted individually; striking F4 creates a list of alternate spellings from which you can choose. You can manually change a word, but you cannot edit surrounding words. You can add any new word to the auxiliary dictionary.

DOCUMENT DISASTER The program's error checks are OK. You are warned, for instance, if you try to exit before saving. But the program does something that's not very friendly at all if you try to save to a floppy disk and fail to close the drive door: your document vanishes, and you must reboot your machine. This could be a serious problem in a program designed for novices, as this one is.



FACT FILE



FriendlyWare,
Version 2.2
FriendlySoft Inc.
3638 West Pioneer
Pkwy.
Arlington, TX 76013
(800) 527-6530
(817) 277-9378

List Price: \$49.95

Requires: 128K RAM, one disk drive, DOS 2.0 or later.

In Short: Comes with a spelling checker but lacks advanced formatting features. Good for letter writing, but be careful to keep your drive door shut or you may lose your work. Not copy protected.

CIRCLE 669 ON READER SERVICE CARD



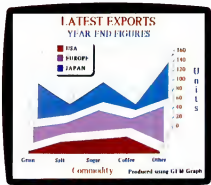
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CIRCLE 239 ON READER SERVICE CARD


WORD PROCESSORS

The printing format choices are limited but adequate for letters. From one menu, you can select one of three sizes of paper (5 by 7, 8½ by 11, and 8½ by 14 inches), horizontal and vertical margins by specific fractions of inches, and 10 or 12 pitch. The program's list of 250 printers most probably contains your printer; if not, you can call the hotline to receive more information.

Two of the nicest features of *FriendlyWare* are the 24-hour hotline and the "no-fine-print" lifetime guarantee. Both of these items are included in the cost of the software. You can also get free updates if the product is changed or revised.

If you want to do no more than write letters, this *FriendlyWare* might be for you. But other inexpensive programs like *Textura* and *Dac Easy Word II* offer far more for about the same price.

—Claire Kincaid



Galaxy

SUITABILITY TO TASK

| | | | | |
|--------------------|---|---|---|---|
| Professional | | | | |
| Corporate | | | | |
| Personal | | | | |
| Legal | | | | |
| Desktop Publishing | | | | |
| | 1 | 2 | 3 | 4 |

Within minutes of sitting down with *Galaxy*, the novice writer can learn nearly everything about this no-frills, few-spills \$49.95 writing program designed by a pair of microcomputer consultants and marketed by OmniVerse. Virtually the full range of the software's features can be reviewed in a few quick glances via seven pull-down menus.

But power users hunting for the kinds of features found in many of the far more expensive corporate or professional word processors—myriad page-formatting tools; a technical thesaurus, algebraic equation solvers—will come up empty-handed from Version 2.2C. (Version 2.3 was expected for release by the end of

File: A:\GALAXY.BUD
F10:MENU
WU
Pg 1 Ln 54 Col 1

screen, and hitting the first letter of a heading pulls down its menu. Hitting the first letter of a feature — print, justify text, reset margin, move block, etc. — instantly invokes it. Many features may be invoked by Quick Command without leaving the text; only a few require a trip to the menu. A second window also can be opened by using the window menu or a keyboard quick command, allowing the writer to swap text from one file to another.

Directory mask: *

| | | | | |
|--------------|--------------|--------------|--------------|--------------|
| GALAXY.COM | GALAXY.CHM | GALAXY.BHR | SETUP.COM | MANEPRN.COM |
| GALAXY.DOC | GALAXY.HSC | AMBK6MCS.PPD | DDM1509.PPD | BROTHER.PPR |
| CANONLAS.PPR | CITRSP10.PPR | M30.PPD | D63RCS.PPR | DMP125.PPD |
| DMP200.PPD | EPSON.PPD | EPSONFX.PPD | EPSONLQ.PPD | HPSONMTX.PPD |
| GERM110.PPD | HPLASER.PPD | IBMGRAPH.PPD | IMPRO.PPD | IBMQUIPT.PPD |
| JUB16100.PPD | HTBR.PPR | MDC3550.PPR | NECPIN.PPR | OKI192.PPD |
| OB12410.PPD | OB192.PPR | SREXP.PPR | TOSH1340.PPR | TOSHP351.PPR |
| WMTS.NEW | NEAL.HB | TEST.1 | TEST.BAX | PRINT.1 |
| PRINT.BAR | PRINT.2 | PINT.3 | BLCD | SCREEN00.CAP |
| SCREEN1.CAP | | | | |

17596416 bytes of disk space from 441488 bytes of memory free

Please press any key to continue

Galaxy's F4 key summons a directory utility window that works without disturbing the file being edited. Since the utility lacks a point-and-shoot method for opening a new file, the filename must be typed at the keyboard.

1987; a copy was unavailable for review at press time.)

Other folks with little use for such capabilities (and *WordStar* users in particular) will find a special affinity for this program. While *Galaxy* includes a number of "Quick Commands" for various filing and editing functions, the software readily invokes the basic vocabulary of *WordStar's* cryptic "Ctrl-K-key" commands for block and cursor movement, and other tasks.

Galaxy users in general will be pleased to find that saving files to disk, as well as cursor movement from top-of-file to bottom and back again, are very, very fast—feats attained by keeping the entire file or files being edited in memory.

The menus couldn't be easier to use. If you've forgotten a Quick Command, F1 summons the help menu; F10 displays all seven menu headings across the top of the screen, and hitting the first letter of a heading pulls down its menu. Hitting the first letter of a feature—print, justify text, reset margin, move block, and so forth—instantly invokes it.

Many features may be invoked by Quick Command without leaving the text; only a few require a trip to the menu. A second window also can be opened by us-

ing the window menu or a keyboard Quick Command, allowing the writer to swap text from one file to another.

SYNTACTICAL SHORTCOMINGS

But *Galaxy's* menu syntax has two obvious shortcomings. First, because the Esc key, used to close menu windows, also in-



FACT FILE



Galaxy, Version 2.2C
OmniVerse
P.O. Box 2974
Remon, WA 98056-0961
(206) 228-7627

List Price: \$49.95 (for software or shareware license).

Requires: 192K RAM, close-compatible DOS machine, one disk drive, DOS 2.0 or later. It supports EGA, 43-line EGA, CGA, VGA.

In Short: Inexpensive, easy to learn, and looks a lot like *WordStar*, but has pull-down menus for filing, windowing, word-search, and formatting functions. Files being edited reside in RAM, which makes for *searching* processing. Not copy protected.

CIRCLE #77 ON READER SERVICE CARD

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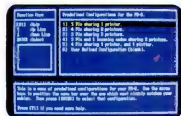
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|--|----------------------------|--------------|---------------|--------------------------|
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| Full desktop publishing | Y | Y | Y | Y |
| Buffer size (Max.) | 4Mb | 1Mb | 500K | 250K |
| Ports | 8-32 | 6 | 6 | 4 |
| Autolink | Y | Y | | Y |
| Copies | Y
(collated) | Y | | Y |
| Popup operations, RAM resident and non-resident | BigPop | SmallPop | | LaserPop |
| Job Cancel | Y | Y | | Y |
| Automatic form feed | Y | Y | | Y |
| Laser tray/forms control | Y | | | |
| Printegration—compatibility for different printers | Y | | | |
| Text enhancement | Y | | | |
| Font management | Y | | | |
| Resource utilization reports | Y | | | |



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1-800-243-2333; in California, 1-800-247-2006.

■ WORD PROCESSORS

vokes *Galaxy's* "undelete" function, an inadvertent extra stroke or two will deposit in your text the last one or two lines you deleted. Second, because *Galaxy's* "directory" and "open file" functions are not paired in a point-and-shoot system, names of files to be opened must be typed in by hand.

To be sure, *Galaxy's* simplicity has its good and bad points. Paragraph indentation, for example, is as simple as tabbing in or moving the cursor with the Spacebar, but don't try to go back and justify a paragraph's margins with the reformat function (Ctrl-B). Reformat tears through indentations and tabs like a buzz saw cutting through a birthday cake: it aligns the text flush against the left margin.

And if you've forgotten to put a blank line between paragraphs—indented or not—the reformat command mashes the two into one. Tabular material will also fall prey to reformat's quirks. In the end, you are stuck with basically one format: the block paragraph.

This is not to say you cannot format a document with *Galaxy*. The program does employ *WordStar*-style markers that, when embedded in the text, enable printing with italics, bold, underline, double-strike, subscripts and superscripts, and headers and footers. *Galaxy* also allows you to devise two "user patches" for other printing effects such as compressed, double-wide, or near-letter-quality type.

UPDATES ON THE WAY Version 2.3 of *Galaxy* has been designed to offer two more user patches and ten keyboard macros for coding of frequently used processes. Point-and-shoot file opening and even faster processing were also planned. Version 3.0, still in development, is expected to scrap the buzz saw in favor of ever-so-polite "auto-reformatting."

While testing the software, I found a minor editing bug in *Galaxy's* word-wrap function: When a string of words was inserted into the middle of a paragraph, *Galaxy* did not word-wrap the displaced text; instead, it left it in the right margin and displayed the message, "Word too long for current margins—press Esc." But hitting the Esc key will do the trick only if you also rope in the offending text that hangs out beyond the right margin. This is done

by simply adding a carriage return.

Another problem during testing resulted from the use of *Galaxy's* "Go to DOS" function. This usually worked without a hitch on my 640K Leading Edge Model D 8088 processor, but three times it cleared the screen, told me it was "Allocating memory for DOS"—and was still allocating 25 minutes later. Because I'm in the habit of saving often, rebooting the system wasn't the disaster it could have been.

Galaxy's designers say that its lean, rudimentary design is its greatest strength, followed closely by its inexpensive \$49.95 price. They may have a point. It is clearly not a writing program for power users and features junkies. But occasional home users, entrepreneurs starting up storefront businesses, and, perhaps, managers of small departments with high turnover may find *Galaxy's* limited scope adequate and its simplicity alluring.

In addition, OmniVerse has won site license agreements with a number of elementary school districts and one college, where students learning English composition may benefit from *Galaxy's* marked lack of distracting bells and whistles. Because this licensing brings the cost per CPU down to as low as \$25, school administrators might be persuaded that, in word processing, less is more.

—Jeffrey K. Parker


ately and include a full accounting system, an information manager, spreadsheet, and components for inventory, order entry, and purchasing. Each package module is installed and operated by means of the \$99 *Harmony System Manager* program, which makes using the series very simple.

The on-disk tutorial and the tutorial booklet make *Harmony* word processing easy to learn. *Harmony's* technical support staff is also very cooperative and eager to help solve any problem, though you pay a rather steep price for this service—\$3.95 per minute with a minimum \$20 charge per call.

The *Harmony* word processor is driven by a multilevel menu system from which you make selections with the function keys. The F1 key (or Esc) always cancels the current function, returning you to the previous menu level or letting you exit the program. F2 activates the context-sensitive on-line help. The first menu level allows you to call up a directory, load or create a file, establish a page format for a document, or merge two files. You also have the option at this stage of creating headers and footers, which may be more than one line if desired. You cannot, however, have different headers and footers for odd and even pages.

EDITING FLEXIBILITY Once text entry begins, the second level of the menu appears, giving you easy access to formatting and editing features. At any point in the document you can set margins, including temporary margins that you can easily restore to the original settings. Text can be centered, justified, underlined, or bold-faced. You can define text by first marking the beginning of a block and then moving the cursor to the block's end, or you can define it a line at a time. Defined blocks of text can be moved, copied, or deleted (and there's an undelete function as well). You also have the option of setting separate margins for a defined block. Another helpful feature lets you change defined text to uppercase, lowercase, title capitalization (the first letter of each word capitalized), or reverse case (uppercase becomes lowercase, and vice versa).

Harmony supports 50 different printers, including laser printers, and its en-



Harmony

SUITABILITY TO TASK

| | | | | |
|--------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| Professional | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| Corporate | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Personal | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Legal | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Desktop Publishing | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | 1 | 2 | 3 | 4 |

Open Systems released its integrated package—*Harmony*, Version 2.03—in May 1987. The \$149 *Harmony Word Processing* module offers a fair amount of flexibility and would be good for business use. Other *Harmony* applications are sold sepa-

| CRANCE PRINTER | | | | | | | | | |
|-------------------|--|-------------------|--|--------------------------|---------------------|---------------|--|---------|--|
| NAME: 0-2410P | | WIDTH (COLS): 000 | | PAGE LENGTH (LINES): 066 | | MICROSPACE: Y | | | |
| MICROINC: 003 | | AUTO LF: N | | BELL: 007 | | CR: 013 | | LF: 010 | |
| TF: 012 | | | | | | | | | |
| INITIALIZATION: | | | | | 000 000 000 000 000 | | | | |
| UNDERLINE ON: | | | | | 027 006 000 000 000 | | | | |
| UNDERLINE OFF: | | | | | 027 006 000 000 000 | | | | |
| HOLD ON: | | | | | 027 055 000 000 000 | | | | |
| HOLD OFF: | | | | | 027 055 000 000 000 | | | | |
| COMPRESS ON: | | | | | 027 066 000 000 000 | | | | |
| COMPRESS OFF: | | | | | 027 054 000 000 000 | | | | |
| EMPHASIZE ON: | | | | | 027 055 000 000 000 | | | | |
| EMPHASIZE OFF: | | | | | 027 056 000 000 000 | | | | |
| 10 PITCH: | | | | | 120 000 000 000 000 | | | | |
| 12 PITCH: | | | | | 144 000 000 000 000 | | | | |
| 15 PITCH: | | | | | 120 000 000 000 000 | | | | |
| 16.5 PITCH(9): | | | | | 120 000 000 000 000 | | | | |
| 8 LINES/INCH: | | | | | 027 037 057 010 000 | | | | |
| 6 LINES/INCH: | | | | | 027 037 057 040 000 | | | | |
| ITALICS ON(1): | | | | | 000 000 000 000 000 | | | | |
| ITALICS OFF(1): | | | | | 000 000 000 000 000 | | | | |
| SUPERSCRP ON(2): | | | | | 027 070 000 000 000 | | | | |
| SUPERSCRP OFF(2): | | | | | 027 069 000 000 000 | | | | |
| SUBSCRIPT ON(3): | | | | | 027 069 000 000 000 | | | | |
| SUBSCRIPT OFF(3): | | | | | 027 069 000 000 000 | | | | |
| TILDE 4: | | | | | 000 000 000 000 000 | | | | |
| TILDE 5: | | | | | 000 000 000 000 000 | | | | |
| TILDE 6: | | | | | 000 000 000 000 000 | | | | |

Harmony's System Manager module allows five default printer command codes, plus three user-defined codes. Codes are embedded within a document by using the tilde and bar characters, followed by the corresponding number.

bedded print commands allow a wide range of effects. There are five print enhancement codes predefined by the word processor: printer pause, italics, superscript, subscript, and compressed print. You also have the option of defining three more commands of your own using your printer's control codes. You embed the commands by inserting the appropriate

printer definition number in your text, preceded by either a tilde (~) to turn the function on or a pipe symbol (|) to turn it off. These codes should be more than adequate to produce the enhancements most people would need. Unfortunately, though, the program doesn't automatically compensate for the document space they take up. To ensure proper spacing, you must temporarily increase the right margin by the number of spaces the command occupies and then release the margin.

There's no document preview mode to show you exactly what your document will look like when you print it. Neither is there a print spooler to let you continue editing while a print job is in progress. You can, however, print part of a document or print multiple copies.

The search-and-replace function can search for any text string, for carriage returns and indents, or for format codes. It will distinguish between individual words and character strings that form part of a longer word (for example, you can search for "his" without stopping on "history"), but it is not case sensitive. A search-and-replace operation can be performed globally on every occurrence of the target string, or you can verify each instance before the

program replaces the appropriate text. The F1 or Esc key terminates the function, while the F3 key lets you repeat it.


ADVANCED FEATURES The program has a few advanced features, but not many. It does have a spelling checker, though the dictionary is a rather small one (only 18,000 words). During the spelling check procedure, the system shows you each potentially misspelled word in context and gives you a chance to edit it. You have the option of looking up a word, but this isn't automatic—you're required to type in either the entire word or a portion of the word using wildcards. The program will let you automatically replace the misspelled word with one of the alternatives it presents. You can also add the flagged word to the dictionary if you wish. You can modify the main dictionary, and you can create as many additional user dictionaries as you like.

For alphabetizing lists, there's a helpful sort routine that can sort on different fields. An automatic backup option will instantly

*For alphabetizing lists,
Harmony includes a
helpful sort routine
that can sort on
different fields.*

save your file before you update it. And there's password protection.

Among the features *Harmony* lacks are automatic hyphenation, mail-merge, and math capability. It can't create independent or snaking columns, and there's no capability for automatically generating footnotes, indexes, tables of contents, or outlines. Another of the program's limitations is that it can't handle files over 30K in size. But if you can make do without these capabilities and you want word processing in an integrated environment, *Harmony* may be a good choice for its editing flexibility and system-maintenance features.—William H. Stewart


FACT FILE

HARMONY

Harmony, Version 2.03
Open Systems Inc.
6477 City West Pkwy
Minneapolis, MN 55344
(800) 328-2276
(612) 829-0008

List Price: Harmony
Word Processing mod-
ule, \$149; Harmony System Manager, \$99.
Requires: 512K RAM, two disk drives,
DOS 2.1 or later.

In Short: Designed to interface with other Harmony applications, including a spreadsheet and a full accounting system; excellent for use with that series. 1 visited dictionary, and printer support. Not copy protected.

CIRCLE 571 ON READER SERVICE CARD

Leading Edge Word Processing

SUITABILITY TO TASK

Professional
Corporate
Personal
Legal
Desktop Publishing



Leading Edge Products is known primarily as a hardware manufacturer, but it bundles *Leading Edge Word Processing*, Version 1.5, with its computers. The program—released in its current version in August 1987—is also available on its own for \$195.

You install the program's three disks using automatic routines that prompt you for the appropriate information about your system. The documentation is very well organized, indexed, and illustrated. There is also an on-line, interactive tutorial that covers the basic functions.

The program's simplicity becomes evident as soon as you see the main screen: the top two lines offer file and status information, while a menu line at the bottom gives you access to file management and printing functions. The main portion of the screen displays a directory that lists only six document files at once, but you can scroll up and down to see other filenames.

Leading Edge uses its own method for naming and organizing files rather than the standard DOS conventions. Files are organized into "folders" (these aren't the same as subdirectories), and both files and folders can bear names up to 30 characters long. In keeping with the filing cabinet metaphor, disk drives are referred to as "drawers," and the program will recognize up to ten of these. *Leading Edge* limits you to a total of 32 folders per drive, each containing 32 documents.

Leading Edge won't let you define or delete a word or a line with merely one keystroke. But a delete-and-store option automatically stores every cut you make and stamps it with the time and date. You

can call up a directory of these cuts, which shows the first few words of each block. When you restore any of them, they reappear in exactly the place they were cut from. There is a drawback to this feature, though. If you don't clean up your delete-and-store memory, it can eat up precious disk space without your realizing it.

You can also make "named cuts" by storing deleted blocks of text under single-character designations. These can be inserted anywhere at any time, allowing you to perform such operations as moving text between two documents. Choosing the option of displaying two documents at once on a split screen makes cutting and pasting between them easy.

FLEXIBLE FORMATTING *Leading Edge* lets you make as many tab and margin changes in a document as you like. The current tab and margin settings are displayed on the format line, which appears just below the status lines when a document is open. All changes in these settings are made on this line. You can even cut and paste format settings as you would text, affording you an easy way to reuse previously established formats.

You also have all the typical character

FACT FILE

Leading Edge Word Processing, Version 1.5
 Product by Inc.
 225 Turnpike St.
 Canton, MA 02021
 (617) 828-8150
 List Price: \$195

Requires: 320K RAM, two disk drives, DOS 2.1 or later.

In Short: *Leading Edge Word Processing* has an easy-to-use interface and is rich in formatting and file management features despite its modest price. Not copy protected.

CIRCLE 681 ON READER SERVICE CARD

formatting options, such as boldface, underline, double underline, and so on, although only underline is shown on the screen. Other character modes appear in reverse video; the only way you can tell what attribute you've assigned to reverse video text is by placing the cursor on one of its characters and referring to the status line.

One of the more interesting and powerful formatting tools of *Leading Edge* is its

| | | | | | |
|--|-------|--------------------|----------------------------|------------------------|-------|
| 5:22pm 12-02-87 | | LE WORD PROCESSING | | Version 1.5 (87-28-87) | |
| CURRENT FOLDER: Initial Document Folder | | | CURRENT DRAWER: C 63x FULL | | |
| Document Name | Pages | Last Date | Time | Create Date | Time |
| Standard Document | 1 | 12-02-87 | 4:28p | 12-02-87 | 4:28p |
| WINTER SALES PROMOTION | 1 | 12-02-87 | 4:23p | 12-02-87 | 4:23p |
| WILLS FOR NEXT YEAR | 1 | 12-02-87 | 4:26p | 12-02-87 | 4:26p |
| LETTER TO McDONALD | 1 | 12-02-87 | 4:21p | 12-02-87 | 4:21p |
| LETTER TO SHI | 1 | 12-02-87 | 4:23p | 12-02-87 | 4:23p |
| PERFORMANCE MANAGEMENT PROJECT | 1 | 12-02-87 | 4:22p | 12-02-87 | 4:22p |
| ----- | | | | | |
| [F1] Print Create Delete Copy Rename Move Archive Folder Utilities | | | | | |
| Exit a document | | | | | |

You can create 32 descriptively named file folders with *Leading Edge Word Processing*. Each folder holds 32 documents.

standard-document feature. Every folder has a standard document, which becomes the template for all other documents you create in that folder. This template can include the text for skeleton forms, preset headers and footers, and preset tabs for tables, or it can just establish page length, line spacing, proportional spacing, and so on. You can even store frequently used lines or phrases as named cuts in the standard document so they are available to every document in the folder.

Some formatting features are lacking, however—most notably the capabilities to use multiple type sizes and to create either independent or snaking columns of text. Also missing are features for automatically generating footnotes, indexes, and tables of contents.

DATA PROTECTION One of the nicest characteristics of the program is its concern for preventing the accidental loss of data. *Leading Edge* automatically saves your text every minute if you are actively typing or after every pause of 15 seconds: if there's a power or hardware failure, you can't lose much. An automatic backup function also lets you back up a document every time it's opened. If you decide not to save any of your changes, all you have to do is restore the backup copy.

Leading Edge has several other significant features. You can create macros of saved text or keystrokes and commands. The mail-merge function for letters, envelopes, and labels allows you to handle mass mailings easily. An 80,000-word dictionary may be expanded by adding your own entries, although there's no thesaurus or hyphenation dictionary. The program will perform basic math functions: addition, subtraction, multiplication, division, and percentages. You can import all or part of a 1-2-3 or *The Twin* worksheet directly into a document without exiting the program first. You can't import graphics, however. *Leading Edge* also contains built-in network support.

All in all, *Leading Edge Word Processing* offers good value for the dollar. A spokesman for Leading Edge Products says that many of the program's weaknesses are being addressed in its next version, due out by the middle of 1988.

—Henry Fersko-Weiss

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A Word Processing Glossary

Not so many years ago, users of the first text formatting programs were startled to see a word typed at the end of one line "wrap" to the beginning of the next. Today, word processing programs can format and print elaborate documents that once required weeks of effort by skilled typesetters and graphics designers.

Like most new things, word processing brought its own jargon—an arcane vocabulary borrowed from printing—which it introduced to those who use computers for writing. To help you understand many of the features listed in the features tables, the following glossary outlines some of the standard and not-so-standard features of the current generation of word processors.

The features tables that follow our glossary are among the most complete and elaborate ever published in *PC Magazine*. To identify these features, reviewers tested each package using a test document—an excerpt from *The Autobiography of Benjamin Franklin*—supplied by the Library of America and converted into ASCII format for use on a PC by Kurzweil Scanners Inc.

Many of the features that you see here were considered advanced a few years ago. Today they can be found in many inexpensive packages. And among the more feature-rich programs, the line that divides word processors from desktop publishing packages is getting thinner every day.

Automatic leading Different-size fonts require different spacing (or "leading") between lines to maintain legibility.

Different-size fonts require different spacing (or "leading") between lines to maintain legibility. Different-size fonts require different spacing (or "leading")

Conditional page break

A hidden code at the end of a paragraph can force a page break if the code is located below a specified line number on the page. If the conditional page break code specifies line 45 as the minimum number, and the text where the code is located prints on line 42, then the page will continue to its normal length. But if the text where the code is located prints at line 48, the page will break at that point, and any subsequent text will begin a new page.

Cross-reference Some programs let you place a nonprinting label (normally a text string like "birthplace") at any point in the text or notes—and include a reference elsewhere in the text that will print out the correct number of the page or note on which the label appears.

Date/time variable

These codes print the date when the file was created (DOS directory date) and the date when it was printed (current DOS date).

Footnote formats

Word processors should print footnotes automatically in the proper format. A footnote is keyed to the text by a number or some other character written as a superscript (or in any other specified style); this character is repeated at the beginning of the footnote, and the entire footnote is printed in any specified font.

Hard hyphen

A hard hyphen is recognized by the program as a place where the line cannot break. For example, when a hyphen is used as a minus sign it should not be followed by a break at the end of a line. The expression 14-6=8 is unambiguous, but if 14- comes at the end of a line and 6=8 begins the next line, it is incorrect.

Hard space A hard space is a space linking two words as an unbreakable unit. Good typographic design requires that certain spaces do not occur at the end of a line. *T. S. Eliot* is correct, but *T. S. Eliot* is unsightly and confusing.

Linked paragraphs and unbreakable blocks

Some word processors can automatically make certain types of heading print on the same page with the text paragraphs below them, even when normal page formatting would cause a page break between the heading and the text. Similarly, an unbreakable block is any block of text (with or without headings) that is specifically marked to print on one page.


Monospaced printing

In monospace type, each character has the same width, and a space character (equal in width to all other characters) separates each word from the next. The text is not justified and the right edge appears ragged (see *proportional-spaced printing*).

In monospace type, each character has the same width,

In justified proportional spacing, each character has a different width, and additional spaces are in-

Snaking columns
Sometimes called newspaper-style columns. When the text of the first column reaches the foot of the page, it continues ("snakes") to the top of the second column on the same page.



aftering about 100,000 and not as standard feature

The features include full-text search facilities across the entire collection and available over public- and private-intranet servers. To identify the articles, reviewers spend each package using a text document—also derived from the Autobiography of Benjamin Franklin—supplied by the Library of America and converted into ASCII format for use with a PC. Raymond Scamman, Inc., the publisher of the book, says that you can have more than one set and purchased a few years ago. Today they can be found in many independent packages. And among the more than 100 programs, the first that divides word

Widows and orphans
A *widow* occurs when the last line of a paragraph appears alone on the top of a page or column, while the rest of the paragraph appears on the preceding one. An *orphan* occurs when the first line of a paragraph appears alone at the foot of a page or column, while the rest of the paragraph appears on the next one. (This is standard word processing usage; traditional publishing vocabulary uses widow to refer to a short line—less than a specified number of characters—at the end of a paragraph.) Programs with widow and orphan control will avoid such problems by shifting a line or two from one page to the next.

and it's many times easier, and it's the first step," says Kohn. "The second step is to determine to what extent you're going to be involved in the marketing of the new line, and how much you want to invest. The third step is to determine how much you want to invest in the new line, and how much you want to invest in the new line."



Word Processors: Summary of Features

(Products listed in alphabetical order)

| Product name | Allegory | Bank Street Writer Plus | Command-Writer | Cat & Paste | Doc Easy Word II | DisplayWrite Assistant | DisplayWrite 4 | Easy Extra | Einstein-Writer |
|--|-----------|-------------------------|----------------|-------------|------------------|------------------------|----------------|------------|-----------------|
| List price | \$395.00 | \$79.95 | \$150.00 | \$14.95 | \$49.95 | \$195.00 | \$495.00 | \$99.00 | \$75.00 |
| Price of upgrade | \$29.95 | \$30.00 | \$10.00 | N/A | N/A | N/A | N/A | N/A | N/A |
| Network version | | | | | | | | | |
| Cost of master program | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| No. of users license allows | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Cost per additional user | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Site license available | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ● | ● |
| Memory usage | | | | | | | | | |
| Expanded memory | ○ | ○ | ● | ○ | ○ | ○ | ○ | ○ | ○ |
| Extended memory | ○ | ○ | ● | ○ | ○ | ○ | ○ | ○ | ○ |
| Disk usage | | | | | | | | | |
| Disk space required | 1,250K | 355K | 660K | None | 606K | 843K | 1,386K | 1,343K | 424K |
| Program is entirely memory resident | ● | ● | ● | ● | ○ | ○ | ○ | ○ | ● |
| Text formatting features | | | | | | | | | |
| Left justification | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Center justification | ○ | ○ | ● | ○ | ● | ○ | ○ | ○ | ○ |
| Right justification | ○ | ○ | ● | ○ | ○ | ○ | ○ | ○ | ○ |
| Proportional spacing | ○ | ○ | ○ | ○ | ● | ● | ○ | ○ | ○ |
| Adjustable left and right margins | ● | ● | ● | ○ | ● | ● | ● | ● | ● |
| Maximum right margin setting | 253 | 125 | 254 | 80 | 127 | 255 | 132 | 255 | 125 |
| Maximum no. of margin changes per document | Unlimited | Unlimited | Unlimited | None | Unlimited | Unlimited | Unlimited | Unlimited | 7 |
| Block indent (left) | ● | ● | ● | ● | ● | ● | ● | ● | ○ |
| Block indent (left and right) | ● | ● | ● | ○ | ○ | ○ | ○ | ○ | ○ |
| 1½-line spacing | ○ | ○ | ● | ○ | ○ | ○ | ○ | ○ | ● |
| Double line spacing | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Triple line spacing | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Auto-indent | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Variable line spacing within document | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 10 characters per inch | ● | ● | ● | ● | ○ | ○ | ○ | ○ | ○ |
| 12 characters per inch | ● | ○ | ● | ● | ○ | ○ | ○ | ○ | ○ |
| Compressed type | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Additional monospace pitches | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| On-screen underlines | ● | ● | ● | ○ | ○ | ○ | ○ | ○ | ○ |
| On-screen bold | ● | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Continuous underlines | ● | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Broken underlines | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Double underlines | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Superscripts | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Subscripts | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Notices | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Bold italics | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Overstrike | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Strikethrough | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Small capitals | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Nonprinting notes replaced by blocks | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Nonprinting notes with space closed up | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Adjustable top and bottom margins | ● | ● | ● | ○ | ○ | ○ | ○ | ○ | ○ |
| Maximum page length (lines) | Unlimited | 120 | 528 | 86 | 84 | 66 | Unlimited | Unlimited | 126 |
| Variable page length within document | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Vertical centering | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Tab stops can be entered anywhere | ● | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Tab move when left margin changes | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Maximum no. of tab stops | Unlimited | Unlimited | 25 | 1 | 60 | Unlimited | Unlimited | Unlimited | 7 |

○—Indicates Editor's Choice ●—Yes ○—No N/A—Not applicable, program does not have this feature

| Product name | The Executive Footnote | The Executive Secretary | Executive Writer | Final Draft | Final Word II | FriendlyWare | Galaxy | Harmony | Leading Edge Word Processing |
|--|------------------------|-------------------------|------------------|-------------|---------------|--------------|-----------|-----------|------------------------------|
| Last price | \$69.95 | \$159.95 | \$69.95 | \$195.00 | \$395.00 | \$49.95 | \$49.95 | \$149.00 | \$195.00 |
| Price of upgrade | \$30.00 | \$7.50 | N/A | \$195.00 | \$38.00 | N/A | N/A | Varies | \$100.00 |
| Network version | | | | | | | | | |
| Cost of master program | N/A | N/A | N/A | N/A | N/A | N/A | N/A | \$249.00 | \$195.00 |
| No. of users license allows | N/A | N/A | N/A | N/A | N/A | N/A | N/A | Unlimited | 1 |
| Cost per additional user | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | \$50.00 |
| Site licenses available | ○ | ○ | ● | ○ | ○ | ○ | ○ | ● | ○ |
| Memory usage | | | | | | | | | |
| Expanded memory | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Extended memory | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Disk usage | | | | | | | | | |
| Disk space required | 178K | 379K | 282K | 1,044K | 360K | 280K | 576K | 700K | 660K |
| Program is entirely memory resident | ○ | ○ | ○ | ○ | ○ | ● | ○ | ● | ○ |
| Text formatting features | | | | | | | | | |
| Left justification | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Center justification | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Right justification | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Proportional spacing | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Adjustable left and right margins | ● | ● | ● | ● | ○ | ○ | ○ | ○ | ○ |
| Maximum right margin setting | Unlimited | 156 | 240 | 132 | 2,000 | 78 | 255 | 132 | 255 |
| Maximum no. of margin changes per document | Unlimited | Unlimited | Unlimited | Unlimited | Unlimited | 1 | Unlimited | Unlimited | Unlimited |
| Block indent (left) | ○ | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Block indent (left and right) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 1½-line spacing | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Double line spacing | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Triple line spacing | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Auto-loading | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Variable line spacing within document | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 10 characters per inch | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 12 characters per inch | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Compressed type | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Additional monospaced pitches | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| On-screen underline | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| On-screen bold | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Continuous underline | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Broken underline | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Double underline | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Superscript | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Subscript | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Italics | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Bold Italics | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Overstrikes | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Strikethrough | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Small capitals | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Nonprinting notes replaced by blanks | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Nonprinting notes with space closed up | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Adjustable top and bottom margins | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Maximum page length (lines) | Unlimited | Unlimited | 99 | Unlimited | ○ | 84 | Unlimited | Unlimited | Unlimited |
| Variable page length within document | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Vertical centering | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Tab stops can be entered anywhere | ○ | ○ | ○ | ○ | ○ | N/A | ○ | ○ | ○ |
| Tab move when left margin changes | ○ | ○ | ○ | ○ | ○ | N/A | ○ | ○ | ○ |
| Maximum no. of tab stops | Unlimited | 16 | 20 | Unlimited | 20 | N/A | Unlimited | Unlimited | Unlimited |

(continues)



Word Processors: Summary of Features

(Products listed in alphabetical order)

| | Lextype Plus II | MASS-11 Word Processor | Microsoft Windows Write | Microsoft Word | MindReader | MultiMate Advantage II | My Word! | New York Word | Note Bene |
|--|-----------------|------------------------|-------------------------|----------------|------------|------------------------|-------------------|---------------|-----------|
| Product name | Lextype Plus II | MASS-11 Word Processor | Microsoft Windows Write | Microsoft Word | MindReader | MultiMate Advantage II | My Word! | New York Word | Note Bene |
| List price | \$495.00 | \$395.00 | \$99.00 | \$450.00 | \$49.95 | \$565.00 | \$49.00 | \$45.00 | \$495.00 |
| Price of upgrade | \$100.00 | \$100.00 | N/A | \$75.00 | \$29.95 | \$100.00 | \$5.00 or \$25.00 | \$15.00 | \$50.00 |
| Network version | | | | | | | | | |
| Cost of master program | \$695.00 | \$395.00 | N/A | \$750.00 | N/A | \$1,495.00 | N/A | N/A | N/A |
| No. of users license allows | None | None | N/A | 1 | N/A | 5 | N/A | N/A | N/A |
| Cost per additional user | \$195.00 | \$100.00 | N/A | \$150.00 | N/A | \$150.00 | N/A | N/A | N/A |
| Site license available | ● | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Memory usage | | | | | | | | | |
| Expanded memory | ○ | ● | ● | ○ | ○ | ○ | ○ | ○ | ○ |
| Extended memory | ○ | ● | ● | ○ | ○ | ○ | ○ | ○ | ○ |
| Disk usage | | | | | | | | | |
| Disk space required | 500K | 2,817K | 192K | 165K | 206K | 2,556K | 480K | 400K | 1,000K |
| Program is entirely memory resident | ○ | ○ | ● | ○ | ● | ○ | ○ | ● | ○ |
| Text formatting features | | | | | | | | | |
| Left justification | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Center justification | ○ | ● | ● | ● | ○ | ● | ○ | ● | ● |
| Right justification | ○ | ● | ● | ● | ○ | ● | ○ | ● | ● |
| Proportional spacing | ○ | ● | ● | ● | ○ | ● | ○ | ● | ● |
| Adjustable left and right margins | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Maximum right margin setting | 125 | 250 | 202 | 220 | 50 | 156 | 32,767 | 255 | Unlimited |
| Maximum no. of margin changes per document | Unlimited | Unlimited | Unlimited | Unlimited | 1 | Unlimited | Unlimited | Unlimited | Unlimited |
| Block indent (left) | ● | ● | ○ | ○ | ○ | ● | ● | ○ | ● |
| Block indent (left and right) | ● | ● | ○ | ○ | ○ | ● | ● | ○ | ● |
| 1½-line spacing | ● | ● | ● | ● | ○ | ● | ● | ○ | ○ |
| Double line spacing | ● | ● | ● | ● | ○ | ● | ● | ○ | ○ |
| Triple line spacing | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Auto-leading | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Variable line spacing within document | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 10 characters per inch | ● | ● | ● | ● | ○ | ● | ● | ○ | ○ |
| 12 characters per inch | ● | ● | ● | ● | ○ | ● | ● | ○ | ○ |
| Compressed type | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Additional monospace pitches | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| On-screen underline | ● | ● | ● | ○ | ○ | ● | ● | ○ | ○ |
| On-screen bold | ○ | ● | ● | ○ | ○ | ● | ● | ○ | ○ |
| Continuous underline | ● | ● | ● | ○ | ○ | ● | ● | ○ | ○ |
| Broken underline | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Double underline | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Superscripts | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Subscripts | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Italics | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Bold italics | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Overstrike | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Strikethrough | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Small capitals | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Noprinting notes replaced by blanks | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Noprinting notes with space closed up | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Adjustable top and bottom margins | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Maximum page length (lines) | 84 | Unlimited | Unlimited | 132 | 132 | 199 | Unlimited | 255 | Unlimited |
| Variable page length within document | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Vertical centering | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Tab can be entered anywhere | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Tabs move when left margin changes | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Maximum no. of tab stops | Unlimited | Unlimited | 12 | Unlimited | Unlimited | Unlimited | Unlimited | Unlimited | Unlimited |

○—Indicates Editor's Choice ●—Yes ○—No N/A—Not applicable; program does not have this feature

| Product name | OfficeWriter | Polaris
Word
Processor | Paperback
Writer | PC-
Type Plus | PC-Write | Personal
QUERTY | Personal
WordPerfect | PFS:
Professional
Write | PracticalWord |
|------------------|--------------|------------------------------|---------------------|------------------|----------|--------------------|-------------------------|-------------------------------|---------------|
| List price | \$495.00 | \$395.00 | \$39.95 | \$69.95 | \$16.00 | \$99.00 | \$195.00 | \$199.00 | \$99.95 |
| Price of upgrade | \$75.00 | \$100.00 | N/A | \$25.00 | \$25.00 | \$15.00 | N/A | N/A | \$15.00 |

Network version

| | | | | | | | | | |
|------------------------------|----------|-----|-----|-----|-----|-----|-----|----------|-----|
| Cost of master program | \$995.00 | N/A | N/A | N/A | N/A | N/A | N/A | \$499.00 | N/A |
| No. of users licenses allows | 3 | N/A | N/A | N/A | N/A | N/A | N/A | 6 | N/A |
| Cost per additional user | \$195.00 | N/A | N/A | N/A | N/A | N/A | N/A | None | N/A |
| Site licenses available | ● | ○ | ● | ○ | ○ | ○ | ○ | ● | ○ |

Memory usage

| | | | | | | | | | |
|-----------------|---|---|---|---|---|---|---|---|---|
| Expanded memory | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Extended memory | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

Disk usage

| | | | | | | | | | |
|-------------------------------------|--------|------|------|------|------|-----|--------|------|------|
| Disk space required | 1,857K | 344K | 175K | 833K | 352K | 95K | 1,600K | 708K | 362K |
| Program is entirely memory resident | ○ | ○ | ○ | ● | ● | ● | ● | ○ | ○ |

Text formatting features

| | | | | | | | | | |
|----------------------|---|---|---|---|---|---|---|---|---|
| Left justification | ○ | ● | ● | ● | ● | ● | ● | ● | ● |
| Center justification | ○ | ○ | ○ | ● | ○ | ○ | ● | ● | ● |
| Right justification | ○ | ○ | ○ | ○ | ○ | ○ | ● | ● | ● |
| Proportional spacing | ○ | ● | ○ | ○ | ● | ○ | ○ | ○ | ○ |

| | | | | | | | | | |
|--|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----|-----------|
| Adjustable left and right margins | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Maximum right margin setting | 250 | 250 | 240 | 240 | 253 | 157 | 250 | 250 | 199 |
| Maximum no. of margin changes per document | Unlimited | Unlimited | Unlimited | Unlimited | Unlimited | Unlimited | Unlimited | 1 | Unlimited |

| | | | | | | | | | |
|-------------------------------|---|---|---|---|---|---|---|---|---|
| Block indent (left) | ● | ● | ○ | ○ | ● | ● | ○ | ● | ○ |
| Block indent (left and right) | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

| | | | | | | | | | |
|---------------------------------------|---|---|---|---|---|---|---|---|---|
| 1½-line spacing | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Double line spacing | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Triple line spacing | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Auto-leading | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Variable line spacing within document | ● | ● | ○ | ○ | ● | ● | ● | ○ | ○ |

| | | | | | | | | | |
|------------------------------|---|---|---|---|---|---|---|---|---|
| 10 characters per inch | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| 12 characters per inch | ● | ● | ○ | ● | ○ | ○ | ○ | ○ | ○ |
| Compressed type | ● | ○ | ○ | ● | ○ | ○ | ○ | ○ | ○ |
| Additional monospace pitches | ● | ● | ○ | ● | ● | ○ | ○ | ○ | ○ |

| | | | | | | | | | |
|----------------------|---|---|---|---|---|---|---|---|---|
| On-screen underline | ● | ● | ○ | ○ | ● | ● | ● | ● | ● |
| On-screen bold | ● | ● | ○ | ○ | ● | ● | ● | ● | ● |
| Continuous underline | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Broken underline | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Double underline | ● | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Superscripts | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Subscripts | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Italics | ● | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Bold Italics | ● | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Overstrike | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Strikethrough | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Smart capitals | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

| | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|
| Nonprinting aster replaced by blocks | ○ | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Nonprinting aster with space closed up | ○ | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

| | | | | | | | | | |
|--------------------------------------|-----------|-----|----|----|-----------|-----------|-----|-----------|-----------|
| Adjustable top and bottom margins | ○ | ● | ● | ● | ○ | ○ | ○ | ○ | ○ |
| Maximum page length (lines) | Unlimited | 250 | 99 | 99 | Unlimited | Unlimited | 100 | Unlimited | Unlimited |
| Variable page length within document | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Vertical centering | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

| | | | | | | | | | |
|------------------------------------|----|----|----|----|-----------|----|-----------|-----------|-----------|
| Tabs can be entered anywhere | ● | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Tabs move when left margin changes | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Maximum no. of tab stops | 30 | 15 | 20 | 30 | Unlimited | 20 | Unlimited | Unlimited | Unlimited |

(continues)

IMS-286

Introducing... the IMS-286/12
Megahertz system; faster
computing speed at a very
intelligent price.

12 MEGAHERTZ

\$1099

Base System

- Intel 80286 processor running at 12MHz, zero wait state, switch selectable to 6MHz
- Phoenix BIOS
- 1MB RAM
- 1.2MB diskette drive
- Dual diskette drive/fixed disk controller
- Enhanced, 101-key keyboard
- Clock-calendar with battery backup
- 200-watt power supply
- Illustrated installation and operations manual

12MHz, MonoGraphic System. \$1199

- High resolution monochrome graphics adapter card
- 12" high-resolution flat screen display
- Intel 80286 running at 12MHz
- 6 to 12MHz switchable clock speed
- Phoenix BIOS
- 1MB RAM
- 1.2MB diskette drive
- Dual diskette drive/fixed disk controller
- Enhanced, 101-key keyboard
- Clock-calendar with battery backup
- 200-watt power supply

12MHz, EGA Color System. \$1549

- Enhanced graphics adapter video card
- 14" high-resolution EGA color monitor
- Intel 80286 running at 12MHz
- 6 to 12MHz switchable clock speed
- Phoenix BIOS
- 1MB RAM
- 1.2MB diskette drive
- Dual diskette drive/fixed disk controller
- Enhanced, 101-key keyboard
- Clock-calendar with battery backup
- 200-watt power supply

12MHz, 40MB MonoGraphic System. \$1699

- 12MHz monographic system featured above, plus:
- 40MB fast access (30 ms) Seagate hard disk
- Disk Manager software

12MHz, 40MB EGA Color System. \$2049

- EGA color system featured above, plus:
- 40MB fast access (30 ms) Seagate hard disk
- Disk Manager software

12MHz, 70MB MonoGraphic System. \$2049

- 12MHz monographic system featured above, plus:
- 70MB fast access (28 ms) MiniScribe hard disk
- Disk Manager software

12MHz, 70MB EGA Color System. \$2399

- EGA color system featured above, plus:
- 70MB fast access (28 ms) MiniScribe hard disk
- Disk Manager software

Memory and Math Coprocessors

- 256K Chips (120ns), nine chips per set...\$42
- Intel 80287-8 math coprocessor...\$269
- 80287-10 math coprocessor...\$349

Diskette Drive

- 360KB or 1.2MB diskette drive to enhance your IMS-286
- 360KB...\$99
- 1.2MB...\$109

AT I/O Board

- Communications support: one serial and one parallel port...\$59

AT Multifunction Card

- 0K expandable to 1.5MB, serial port, parallel port, game port...\$139

1200 Baud External Modem

- Auto answer, auto dial, auto voice/data switching...\$89

Also available... the IMS-286/10:
base system \$899

INTELLIGENT BUYERS shop for superior products and superior value. All of our products come with a one-year warranty, one year of technical phone support, and a 30-day money-back guarantee. We do not charge you for UPS ground shipping within the continental United States, or for buying with your credit card. Intelligent Micro Systems is The Intelligent Choice. New Hours: Mon.-Fri. 8 A.M.—9 P.M. C.S.T., Sat. 9 A.M.—5 P.M. C.S.T. Technical Support: Mon.-Fri. 9 A.M.—5 P.M. C.S.T. Texas residents please 8% sales tax.

IMS-88

10 MEGAHERTZ

\$449

Base System

- Intel 8088-1 processor running at 10MHz, switchable to 4.77MHz
- 640KB RAM
- 360KB diskette drive
- Diskette drive controller
- AT-style keyboard
- 150-watt power supply
- Illustrated installation and operations manual

10MHz, MonoGraphic System. \$579

- High resolution monochrome graphics adapter card
- 12" high-resolution flat screen display
- Intel 8088 processor running at 10MHz
- 4.77 to 10MHz switchable clock speed
- 640KB RAM
- 360KB diskette drive
- Diskette drive controller
- AT-style keyboard
- 150-watt power supply

10MHz, 20MB MonoGraphic System. \$869

- 10MHz monographic system featured above, plus:
- Reliable 20MB MiniScribe hard disk system with Western Digital controller

10MHz, 40MB MonoGraphic System. \$979

- 10MHz monographic system featured above, plus:
- Reliable 40MB MiniScribe hard disk system with Western Digital RLL controller

10MHz, EGA Color System. \$919

- Enhanced graphics adapter video card
- 14" high-resolution EGA color monitor
- Intel 8088 processor running at 10MHz
- 4.77 to 10MHz switchable clock speed
- 640KB RAM
- 360KB diskette drive
- Diskette drive controller
- AT-style keyboard
- 150-watt power supply

10MHz, 20MB EGA Color System. \$1259

- EGA color system featured above, plus:
- Reliable 20MB MiniScribe hard disk system with Western Digital controller

10MHz, 40MB EGA Color System. \$1319

- EGA color system featured above, plus:
- Reliable 40MB MiniScribe hard disk system with Western Digital controller

Diskette Drive

360KB diskette drive to enhance your
IMS-88...\$99

PCI/O Board

Clock/Calendar, serial port, parallel
port, game port...\$65

PC Multifunction Card

384KB RAM, serial port, parallel port, game
port and clock/calendar with battery
back-up...\$199

576KB Expansion Board

Expandable to 192KB, 384, or 576KB with
64KB or 204KB chips. Comes with 0KB...\$35

1200 Baud Internal Modem

1200 baud internal modem for
communications support...\$69



To Order Call Toll Free:
800-247-3084

In Texas Call:
800-777-7757
For Technical Support
512-250-8794

IMS

Intelligent Micro Systems

1633 Babcock, Suite 424 San Antonio, Tx. 78229





Word Processors: Summary of Features

(Products listed in alphabetical order)

| Product name | Professional
Writer's
Package | Q&A
Write | R Word
Plus | Samson
Plus IV | Textura
Version 4.0,
\$29.95,
\$19.99-95
Price includes
3 upgrades | Typist | Vantex
Word | Varsity
Script | Volkswriter
Deluxe
Plus |
|--|-------------------------------------|------------------|-------------------|-------------------|---|-----------|----------------|-------------------|-------------------------------|
| Last price | \$490.00 | \$199.00 | \$495.00 | \$695.00 | | \$45.00 | \$119.99 | \$99.95 | \$99.00 |
| Price of upgrade | \$35.00 | N/A | \$25.00 | \$30.00 | | N/A | \$65.00 | N/A | \$45.00 |
| Network version | | | | | | | | | |
| Cost of master program | N/A | \$199.00 | \$1,295.00 | \$1,475.00 | N/A | N/A | N/A | N/A | N/A |
| No. of users license allows | N/A | 1 | 16 | 3 | N/A | N/A | N/A | N/A | N/A |
| Cost per additional user | N/A | \$179.00/3 users | \$290.00/16 users | \$490.00 | N/A | N/A | N/A | N/A | N/A |
| Site license available | ○ | ○ | ● | ● | ○ | ○ | ○ | ○ | ● |
| Memory usage | | | | | | | | | |
| Expanded memory | ○ | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Extended memory | ○ | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Disk usage | | | | | | | | | |
| Disk space required | 512K | 720K | 585K | 1,356K | 700K | 185K | 700K | 568K | 450K |
| Program is entirely memory resident | ○ | ● | ○ | ○ | ● | ● | ● | ○ | ○ |
| Text formatting features | | | | | | | | | |
| Left justification | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Center justification | ● | ○ | ● | ○ | ○ | ○ | ● | ○ | ○ |
| Right justification | ● | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Proportional spacing | ● | ● | ● | ● | ○ | ○ | ● | ● | ● |
| Adjustable left and right margins | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Maximum right margin setting | 132 | 240 | 240 | 250 | 240 | 80 | Unlimited | 255 | 250 |
| Maximum no. of margin changes per document | Unlimited | Unlimited | Unlimited | 57 | Unlimited | Unlimited | Unlimited | Unlimited | 1 |
| Block indent (left) | ● | ● | ● | ● | ○ | ● | ○ | ○ | ● |
| Block indent (left and right) | ● | ○ | ○ | ● | ○ | ○ | ○ | ○ | ○ |
| 1/4-line spacing | ○ | ○ | ● | ○ | ○ | ○ | ● | ● | ○ |
| Double line spacing | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Triple line spacing | ○ | ○ | ● | ○ | ○ | ○ | ○ | ○ | ○ |
| Auto-leading | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Variable line spacing within document | ○ | ● | ○ | ○ | ○ | ○ | ● | ● | ○ |
| 16 characters per inch | ● | ● | ● | ● | ○ | ● | ○ | ● | ● |
| 12 characters per inch | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Compressed type | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Additional monospace pitches | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| On-screen underline | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| On-screen bold | ● | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Continuous underline | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Broken underline | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Double underline | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Superscripts | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Subscripts | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Italics | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Bold Italics | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Overstrike | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Strikethrough | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Small capitals | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Nonprinting codes replaced by blanks | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Nonprinting notes with space closed up | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Adjustable top and bottom margins | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Maximum page length (lines) | Unlimited | 192 | Unlimited | 180 | 240 | 250 | Unlimited | 999 | 255 |
| Variable page length within document | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Vertical centering | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Tab can be entered anywhere | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Tab move when left margin changes | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Maximum no. of tab stops | Unlimited | Unlimited | Unlimited | 30 | 15 | Unlimited | 50 | 48 | Unlimited |

○—Indicates Editor's Choice ●—Yes ○—No N/A—Not applicable, program does not have this feature

| Product name | Volks-
writer 3 | Webster's
NewWorld
Writer I | PC
Word-
Perfect | WordStar
Profe-
sional | WordStar
2000 Plus
Upgrade
Personal
\$495.00
upgrade \$105.00 | WPS-PC | Write Now | Write 'n'
Spell | XyWrite III
Plus | ZeeWord |
|---|--------------------|-----------------------------------|------------------------|------------------------------|--|-----------|-----------|--------------------|---------------------|-----------|
| List price | \$295.00 | \$99.95 | \$495.00 | \$495.00 | \$275.00 | \$150.00 | \$129.00 | \$445.00 | \$39.95 | \$19.95 |
| Price of upgrade | \$95.00 | Free | \$35.00 | \$89.00 | \$89.00 | N/A | N/A | N/A | N/A | N/A |
| Network version | | | | | | | | | | |
| Cost of master program | \$595.00 | N/A | \$695.00 | \$495.00 | Both 30 personal
users 10 legal | N/A | N/A | N/A | N/A | N/A |
| No. of users license allows | 3 | N/A | Unlimited | 1 | 1 | N/A | N/A | N/A | N/A | N/A |
| Cost per additional user | \$95.00 | N/A | \$150.00 | \$150.00 | \$150.00 | N/A | N/A | N/A | N/A | N/A |
| Site license available | ● | ● | ● | ● | ● | ● | ○ | ● | ○ | ○ |
| Memory usage | | | | | | | | | | |
| Expanded memory | ○ | ○ | ○ | ○ | ● | ○ | ○ | ○ | ● | ○ |
| Extended memory | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ● | ○ |
| Disk usage | | | | | | | | | | |
| Disk space required | 650K | 1,080K | 1,100K | 700K | 1,500K | 380K | 300K | 450K | 750K | 265K |
| Program is entirely memory resident | ○ | ○ | ○ | ○ | ○ | ○ | ● | ● | ● | ● |
| Text formatting features | | | | | | | | | | |
| Left justification | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Center justification | ○ | ○ | ● | ○ | ○ | ○ | ○ | ● | ● | ○ |
| Right justification | ○ | ○ | ● | ○ | ○ | ○ | ○ | ● | ● | ○ |
| Proportional spacing | ● | ○ | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Adjustable left and right margins | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Maximum right margin setting | 250 | 78 | 250 | 255 | 240 | 131 | 80 | 250 | 255 | 511 |
| Maximum no. of merge changes per document | 250 | Unlimited | Unlimited | Unlimited | Unlimited | Unlimited | Unlimited | Unlimited | Unlimited | Unlimited |
| Block indent (left) | ● | ● | ● | ● | ● | ● | ○ | ● | ● | ○ |
| Block indent (left and right) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 1½-line spacing | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Double line spacing | ● | ● | ● | ● | ● | ○ | ○ | ○ | ○ | ○ |
| Triple line spacing | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Auto-leading | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Variable line spacing within document | ● | ● | ● | ● | ● | ● | ○ | ● | ● | ● |
| 10 characters per inch | ● | ● | ● | ● | ● | ● | ● | ● | ● | ○ |
| 12 characters per inch | ● | ● | ● | ● | ● | ● | ● | ● | ● | ○ |
| Compressed type | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Additional monospace pitches | ● | ○ | ● | ● | ● | ● | ● | ● | ● | ○ |
| On-screen underline | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| On-screen bold | ● | ● | ● | ● | ● | ○ | ○ | ● | ● | ○ |
| Continuous underline | ● | ● | ● | ● | ● | ○ | ○ | ○ | ○ | ○ |
| Broken underline | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Double underline | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Superscripts | ● | ○ | ● | ● | ● | ○ | ○ | ○ | ○ | ○ |
| Subscripts | ● | ○ | ● | ● | ● | ○ | ○ | ○ | ○ | ○ |
| Italics | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Bold Italics | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Overstrike | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Strikethrough | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Small capitals | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Nonprinting codes replaced by blanks | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Nonprinting codes with space closed up | ● | ● | ● | ● | ● | ○ | ○ | ○ | ○ | ○ |
| Adjustable top and bottom margins | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Maximum page length (lines) | 255 | 56 | 108 | Unlimited | Unlimited | 200 | 250 | Unlimited | Unlimited | Unlimited |
| Variable page length within document | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Vertical centering | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Tab can be entered anywhere | ● | ● | ● | ● | ● | ○ | ○ | ○ | ○ | ○ |
| Tab moves when left margin changes | ○ | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Maximum no. of tab stops | Unlimited | Unlimited | Unlimited | 32 | 249 | Unlimited | Unlimited | Unlimited | 21 | Unlimited |

(continues)



Word Processors: Summary of Features

(Products listed in alphabetical order)

| Product name | Allegory | Bank Street Writer Plus | Command-Writer | Cut & Paste | Doc Easy Word II | DisplayWrite Assistant | DisplayWrite 4 | Easy Extra | Einstein-Writer |
|---|----------|-------------------------|----------------|-------------|------------------|------------------------|----------------|------------|-----------------|
| Last price | \$395.00 | \$79.95 | \$150.00 | \$14.95 | \$49.95 | \$195.00 | \$495.00 | \$99.00 | \$75.00 |
| Price of upgrade | \$29.95 | \$30.00 | \$10.00 | N/A | N/A | N/A | \$75.00 | N/A | N/A |
| Text formatting features | | | | | | | | | |
| Hard page breaks | ● | ● | ● | ○ | ● | ● | ● | ● | ● |
| Conditional page breaks | ○ | ○ | ○ | ○ | ○ | ● | ● | ○ | ○ |
| Paragraphs can be linked | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Unbreakable blocks | ○ | ○ | ● | ○ | ○ | ○ | ○ | ○ | ○ |
| Widow control | ○ | ○ | ● | ● | ○ | ○ | ○ | ○ | ● |
| Orphan control | ○ | ○ | ● | ● | ○ | ○ | ○ | ○ | ● |
| Automatic page numbering | ● | ● | ● | ○ | ● | ● | ● | ● | ● |
| Automatic resetting of page numbers | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Create borders | ● | ● | ● | ○ | ● | ● | ● | ● | ● |
| Create footers | ● | ● | ● | ○ | ● | ● | ● | ● | ● |
| Command strategy | | | | | | | | | |
| Full-screen menus | ● | ○ | ● | ○ | ○ | ○ | ○ | ○ | ● |
| Partial-screen menus | ○ | ● | ○ | ● | ● | ● | ● | ● | ○ |
| Lotus-style menus | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Bypass mouse | ○ | ○ | ● | ○ | ○ | ○ | ○ | ○ | ○ |
| Command line | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Function keys used with Alt/Shift/Ctrl | ● | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Alphanumeric keys used with Alt/Ctrl | ● | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Permanent defaults | ● | ● | ● | ○ | ○ | ○ | ○ | ○ | ○ |
| Temporary defaults | ● | ● | ● | ○ | ○ | ○ | ○ | ○ | ○ |
| Screen displays | | | | | | | | | |
| Screen displays ruler line | ● | ○ | ● | ○ | ● | ● | ● | ● | ● |
| Ruler line can be suppressed | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Ruler/status line shows character columns | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Margin positions are graphically displayed | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Ruler/status line shows line number | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Ruler/status line shows page number | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Ruler/status line shows filename | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Program shows current drive and path | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Ruler line shows DOS date and/or time | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Page breaks are shown while typing | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Paragraph markers are normally shown | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Text entry and editing | | | | | | | | | |
| Status messages indicate special typing modes | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Insert and overstrike modes are available | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Deleting | | | | | | | | | |
| Entire word | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Entire line | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Sentence | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Paragraph | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Page | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Column | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Delete capability | | | | | | | | | |
| Multiple delete levels | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Mouse-controllable cursor | | | | | | | | | |
| Word block | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Line block | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Sentence block | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Paragraph block | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Column block | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

— Indicates Editor's Choice ●—Yes ○—No N/A—Not applicable; program does not have this feature.

| | The Executive
Fountain | The Executive
Secretary | Executive
Writer | Final
Draft | Final
Word II | Friendly-
Ware | Galaxy | Hermes | Leading
Edge Word
Processing |
|---|---------------------------|----------------------------|---------------------|----------------|------------------|-------------------|---------|----------|------------------------------------|
| Product name | | | | | | | | | |
| List price | \$69.95 | \$159.95 | \$69.95 | \$195.00 | \$395.00 | \$49.95 | \$49.95 | \$149.00 | \$195.00 |
| Price of upgrade | \$30.00 | \$7.50 | N/A | \$195.00 | \$38.00 | N/A | N/A | Vanes | \$100.00 |
| Text formatting features | | | | | | | | | |
| Hard page breaks | ● | ● | ● | ● | ● | ○ | ● | ● | ● |
| Conditional page breaks | ● | ● | ● | ○ | ● | ○ | ○ | ○ | ○ |
| Paragraphs can be linked | ○ | ○ | ○ | ○ | ● | ○ | ○ | ○ | ○ |
| Unbreakable blocks | ○ | ○ | ○ | ○ | ● | ○ | ○ | ○ | ○ |
| Widow control | ○ | ○ | ● | ○ | ● | ○ | ○ | ○ | ● |
| Orphan control | ○ | ● | ○ | ○ | ● | ○ | ○ | ○ | ● |
| Automatic page numbering | ● | ● | ● | ● | ● | ○ | ● | ● | ● |
| Automatic resetting of page numbers | ● | ● | ● | ● | ● | ○ | ○ | ○ | ● |
| Creates headers | ● | ● | ● | ● | ● | ○ | ● | ● | ● |
| Creates footers | ● | ● | ● | ● | ● | ○ | ● | ● | ● |
| Command strategy | | | | | | | | | |
| Full-screen menus | ● | ○ | ● | ● | ○ | ● | ○ | ● | ● |
| Partial-screen menus | ● | ○ | ○ | ○ | ● | ● | ○ | ○ | ● |
| Lotus-style menus | ○ | ○ | ● | ○ | ● | ○ | ● | ○ | ● |
| Bypass menus | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Command line | ● | ○ | ○ | ○ | ○ | ○ | ● | ○ | ○ |
| Function keys used with Alt/Shift/Ctrl | ○ | ○ | ● | ○ | ○ | ● | ○ | ○ | ○ |
| Alphanumeric keys used with Alt/Ctrl | ○ | ● | ● | ○ | ○ | ○ | ○ | ○ | ○ |
| Permanent defaults | ○ | ● | ● | ● | ● | ● | ● | ● | ● |
| Temporary defaults | ● | ● | ○ | ○ | ○ | ● | ● | ● | ○ |
| Screen displays | | | | | | | | | |
| Screen displays ruler line | ● | ● | ● | ● | ○ | ○ | ● | ● | ● |
| Ruler line can be suppressed | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Ruler/status line shows character columns | ○ | ○ | ○ | ○ | ● | ○ | ○ | ○ | ○ |
| Margin positions are graphically displayed | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Ruler/status line shows line number | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Ruler/status line shows page number | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Ruler/status line shows document filename | ○ | ● | ● | ○ | ○ | ○ | ○ | ○ | ○ |
| Program shows current drive and path | ● | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Ruler line shows DOS date and/or time | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Page breaks are shown while typing | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Paragraph markers are normally shown | ● | ○ | ● | ● | ○ | ○ | ○ | ○ | ○ |
| Text entry and editing | | | | | | | | | |
| Status messages indicate special typing modes | ● | ○ | ● | ● | ○ | ○ | ○ | ○ | ○ |
| Insert and overstrike modes are available | ● | ● | ● | ● | ● | ○ | ○ | ○ | ○ |
| Deleting | | | | | | | | | |
| Entire word | ● | ● | ● | ● | ● | ○ | ○ | ○ | ○ |
| Entire line | ● | ● | ● | ● | ● | ○ | ○ | ○ | ○ |
| Sentence | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Paragraph | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Page | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Columns | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Undelete capability | | | | | | | | | |
| Multiple undelete levels | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Mouse-controllable cursor | | | | | | | | | |
| Word block | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Line block | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Sentence block | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Paragraph block | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Column block | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

(continues)



Word Processors: Summary of Features

(Products listed in alphabetical order)

| | Lexitype
Plus II | MASS-11
Word
Processor | Microsoft
Windows
Write | PC
Microsoft
Word | MindReader | MultiMate
Advantage II | My Word! | New York
Word | Nono
Bee |
|---|---------------------|------------------------------|-------------------------------|-------------------------|------------|---------------------------|-------------------|------------------|-------------|
| Product name | | | | | | | | | |
| Last price | \$495.00 | \$395.00 | \$99.00 | \$450.00 | \$49.95 | \$565.00 | \$49.00 | \$45.00 | \$495.00 |
| Price of upgrade | \$100.00 | \$100.00 | N/A | \$75.00 | \$29.95 | \$100.00 | \$0.00 or \$25.00 | \$15.00 | \$50.00 |
| Text formatting features | | | | | | | | | |
| Hard page breaks | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Conditional page breaks | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Paragraphs can be linked | ○ | ○ | ○ | ● | ○ | ○ | ○ | ○ | ○ |
| Unbreakable blocks | ○ | ○ | ○ | ● | ○ | ○ | ○ | ○ | ○ |
| Widow control | ○ | ○ | ○ | ● | ○ | ○ | ○ | ○ | ○ |
| Orphan control | ○ | ○ | ○ | ● | ○ | ○ | ○ | ○ | ○ |
| Automatic page-numbering | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Automatic renumbering of page numbers | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Creates headers | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Creates footers | ● | ● | ● | ● | ○ | ● | ● | ● | ● |
| Command strategy | | | | | | | | | |
| Full-screen menu | ● | ● | ○ | ○ | ○ | ● | ○ | ○ | ○ |
| Partial-screen menu | ○ | ○ | ● | ● | ● | ○ | ○ | ○ | ○ |
| Lotus-style menu | ○ | ○ | ○ | ● | ○ | ○ | ○ | ○ | ○ |
| Bypass menu | ○ | ○ | ● | ○ | ○ | ○ | ○ | ○ | ○ |
| Command line | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Function keys used with Alt/Shift/Ctrl | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Alphanumeric keys used with Alt/Ctrl | ● | ● | ● | ● | ○ | ● | ● | ● | ○ |
| Permanent defaults | ● | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Temporary defaults | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Screen displays | | | | | | | | | |
| Screen displays ruler line | ● | ● | ● | ● | ○ | ● | ● | ● | ● |
| Ruler line can be suppressed | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Header/status line shows character columns | ● | ● | ○ | ● | ○ | ● | ○ | ○ | ○ |
| Margin positions are graphically displayed | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Header/status line shows line number | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Header/status line shows page number | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Header/status line shows filename | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Program shows current drive and path | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Ruler line shows DOS date and/or time | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Page breaks are shown while typing | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Paragraph markers are normally shown | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Text entry and editing | | | | | | | | | |
| Status messages indicate special typing modes | ○ | ● | ○ | ○ | ○ | ● | ○ | ○ | ○ |
| Insert and overstrike modes are available | ● | ● | ● | ● | ○ | ● | ○ | ○ | ○ |
| Deleting | | | | | | | | | |
| Entire word | ○ | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Entire line | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Sentence | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Paragraph | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Page | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Columns | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Undo/redo capability | | | | | | | | | |
| Multiple undo/redo levels | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Mouse-controllable cursor | | | | | | | | | |
| Word block | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Line block | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Sentence block | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Paragraph block | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Column block | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

PC — Indicates Editor's Choice ● — Yes ○ — No N/A — Not applicable, program does not have this feature

| Product name | OfficeWriter | Poliostrir Word Processor | Paperback Writer | PC-Type Plus | PC-Write | Personal QWERTY | Personal WordPerfect | PFS: Professional Write | PractiWord |
|------------------|--------------|---------------------------|------------------|--------------|----------|-----------------|----------------------|-------------------------|------------|
| List price | \$495.00 | \$395.00 | \$39.95 | \$69.95 | \$16.00 | \$99.00 | \$195.00 | \$199.00 | \$99.95 |
| Price of upgrade | \$75.00 | \$100.00 | N/A | \$25.00 | \$25.00 | \$15.00 | N/A | N/A | \$15.00 |

Text formatting features

| | | | | | | | | | |
|-------------------------------------|---|---|---|---|---|---|---|---|---|
| Hard page breaks | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Conditional page breaks | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Paragraphs can be labeled | ○ | ○ | ○ | ○ | ● | ○ | ○ | ○ | ○ |
| Unbreakable blocks | ● | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Widow control | ● | ● | ○ | ○ | ○ | ● | ● | ○ | ○ |
| Orphan control | ● | ● | ○ | ○ | ○ | ● | ● | ○ | ○ |
| Automatic page numbering | ● | ● | ● | ● | ● | ● | ● | ○ | ● |
| Automatic resetting of page numbers | ● | ● | ○ | ○ | ○ | ○ | ○ | ● | ● |
| Creates headers | ● | ● | ○ | ● | ● | ● | ● | ● | ● |
| Creates footers | ● | ● | ○ | ● | ● | ● | ● | ● | ● |

Command strategy

| | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|
| Full-screen menus | ● | ● | ● | ○ | ○ | ○ | ● | ○ | ● |
| Partial-screen menus | ● | ○ | ○ | ○ | ● | ○ | ○ | ● | ● |
| Let's-style menus | ○ | ○ | ● | ○ | ○ | ○ | ○ | ○ | ○ |
| Bypass menus | ○ | ○ | ○ | ● | ● | ● | ○ | ● | ● |
| Command line | ○ | ○ | ○ | ● | ● | ○ | ● | ○ | ○ |
| Function keys used with Alt/Shift/Ctrl | ● | ○ | ● | ● | ● | ○ | ● | ○ | ● |
| Alphanumeric keys used with Alt/Ctrl | ● | ○ | ○ | ● | ● | ○ | ○ | ● | ○ |
| Permanent defaults | ● | ○ | ○ | ● | ● | ○ | ○ | ● | ● |
| Temporary defaults | ● | ○ | ● | ● | ● | ○ | ● | ○ | ● |

Screen displays

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Screen displays ruler line | ● | ● | ● | ○ | ● | ● | ○ | ● | ● |
| Ruler line can be suppressed | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Ruler/status line shows character codes | ● | ○ | ○ | ● | ● | ○ | ○ | ● | ● |
| Merge positions are graphically displayed | ● | ● | ○ | ● | ● | ● | ● | ● | ● |
| Ruler/status line shows line number | ● | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Ruler/status line shows page number | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Ruler/status line shows filename | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Program shows current drive and path | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Ruler line shows DOS date and/or time | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Page breaks are shown while typing | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Paragraph markers are normally shown | ● | ● | ● | ○ | ○ | ○ | ○ | ○ | ○ |

Text entry and editing

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Status messages indicate special typing modes | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Insert and overstrike modes are available | ○ | ● | ● | ● | ● | ● | ● | ● | ● |
| Deleting | | | | | | | | | |
| Entire word | ● | ○ | ○ | ○ | ● | ● | ● | ● | ● |
| Entire line | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Sentence | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Paragraph | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Page | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Columns | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Undelete capability | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Multiple undelete levels | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Mouse-controllable cursor | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Word block | ● | ● | ○ | ○ | ● | ● | ● | ● | ● |
| Line block | ● | ● | ○ | ○ | ● | ● | ● | ○ | ○ |
| Sentence block | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Paragraph block | ● | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Column block | ● | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

(continues)



Word Processors: Summary of Features

(Products listed in alphabetical order)

| Product name | Professional
Writer's
Package | Q&A
Write | R Word
Plus | Samas
Plus IV | Textre
Version 4.0,
\$29.95,
\$50.00 (95)
Price includes
3 upgrades | Typist | Venture
Word | Versity
Script | Voltswriter
Deluxe
Plus |
|---|-------------------------------------|--------------|----------------|------------------|--|---------|-----------------|-------------------|-------------------------------|
| List price | \$490.00 | \$199.00 | \$495.00 | \$685.00 | \$25.00 | \$45.00 | \$119.99 | \$99.95 | \$99.00 |
| Price of upgrade | \$35.00 | N/A | \$25.00 | \$30.00 | N/A | N/A | \$65.00 | N/A | \$45.00 |
| Text formatting features | | | | | | | | | |
| Hard page breaks | ● | ● | ● | ● | ● | ○ | ● | ● | ● |
| Conditional page breaks | ● | ○ | ○ | ● | ● | ○ | ○ | ○ | ○ |
| Paragraphs can be linked | ● | ○ | ○ | ○ | ○ | ○ | ● | ○ | ○ |
| Unbreakable blocks | ● | ○ | ● | ● | ● | ○ | ● | ● | ○ |
| Widow control | ● | ○ | ● | ● | ○ | ○ | ● | ● | ○ |
| Orphan control | ● | ○ | ● | ● | ○ | ○ | ● | ● | ○ |
| Automatic page numbering | ● | ● | ● | ● | ● | ○ | ● | ● | ● |
| Automatic resetting of page numbers | ● | ● | ● | ● | ● | ○ | ○ | ○ | ● |
| Creates headers | ● | ● | ● | ● | ● | ○ | ● | ● | ● |
| Creates footers | ● | ● | ● | ● | ● | ○ | ● | ● | ● |
| Command strategy | | | | | | | | | |
| Full-screen menus | ● | ● | ○ | ○ | ● | ○ | ○ | ○ | ○ |
| Partial-screen menus | ○ | ○ | ● | ● | ● | ○ | ○ | ● | ● |
| Lotus-style menus | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Bypass menus | ● | ● | ○ | ○ | ○ | ● | ○ | ○ | ○ |
| Command line | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Function keys used with Alt/Shift/Ctrl | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Alphanumeric keys used with Alt/Ctrl | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Permanent defaults | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Temporary defaults | ● | ○ | ● | ○ | ○ | ○ | ○ | ● | ● |
| Screen displays | | | | | | | | | |
| Screen displays ruler line | ○ | ● | ● | ● | ● | ○ | ● | ● | ○ |
| Ruler line can be suppressed | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Ruler/status line shows character columns | ● | ● | ● | ● | ● | ○ | ● | ○ | ● |
| Margin positions are graphically displayed | ○ | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Ruler/status line shows line number | ● | ● | ● | ● | ● | ○ | ● | ○ | ○ |
| Ruler/status line shows page number | ○ | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Ruler/status line shows line count | ● | ● | ● | ○ | ○ | ○ | ○ | ○ | ○ |
| Program shows current drive and path | ● | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Ruler line shows DOS date and/or time | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Page breaks are shown while typing | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Paragraph markers are normally shown | ○ | ● | ● | ● | ○ | ○ | ○ | ○ | ○ |
| Text entry and editing | | | | | | | | | |
| Status messages indicate special typing modes | ● | ● | ● | ● | ○ | ○ | ● | ○ | ○ |
| Insert and overstrike modes are available | ● | ● | ● | ● | ○ | ○ | ○ | ○ | ○ |
| Deleting | | | | | | | | | |
| Entire word | ● | ● | ● | ● | ○ | ○ | ○ | ○ | ○ |
| Entire line | ● | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Sentence | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Paragraph | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Page | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Column | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Undo capability | | | | | | | | | |
| Multiple undo levels | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Mouse-controllable cursor | | | | | | | | | |
| Word block | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Line block | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Sentence block | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Paragraph block | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Column block | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

PC — Indicates Editor's Choice ● — Yes ○ — No N/A — Not applicable; program does not have this feature.

| Product name | Volks-
writer 3 | Webster's
NewWorld
Writer I | Word-
Perfect | WordStar
Professional | WordStar
2000 Plus
Upgrade
<small>(\$495.00
list; \$395.00
street)</small> | WPS-PC | Write Now | Write 'n
Spell | XyWrite III
Plus | ZenWord |
|---|--------------------|-----------------------------------|------------------|--------------------------|---|----------|-----------|-------------------|---------------------|---------|
| List price | \$295.00 | \$99.95 | \$495.00 | \$495.00 | \$89.00 | \$275.00 | \$150.00 | \$129.00 | \$445.00 | \$39.95 |
| Price of upgrade | \$95.00 | Free | \$35.00 | \$89.00 | \$89.00 | \$50.00 | N/A | N/A | \$50.00 | \$19.95 |
| Text formatting features | | | | | | | | | | |
| Hard page breaks | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Conditional page breaks | ○ | ○ | ● | ● | ○ | ○ | ○ | ● | ● | ○ |
| Paragraphs can be linked | ○ | ○ | ● | ● | ○ | ○ | ○ | ● | ● | ○ |
| Unbreakable blocks | ○ | ○ | ○ | ● | ○ | ○ | ○ | ● | ● | ○ |
| Widow control | ○ | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Orphan control | ○ | ● | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Automatic page numbering | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Automatic resetting of page numbers | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Creates headers | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Creates footers | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Command strategy | | | | | | | | | | |
| Full-screen menus | ○ | ○ | ○ | ○ | ● | ● | ○ | ○ | ○ | ○ |
| Partial-screen menus | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Lotus-style menus | ○ | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Bypass menus | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Command line | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Function keys used with Alt/Shift/Ctrl | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Alphanumeric keys used with Alt/Ctrl | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Permanent defaults | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Temporary defaults | ● | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Screen displays | | | | | | | | | | |
| Screen displays ruler line | ● | ○ | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Ruler line can be suppressed | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Ruler/status line shows character columns | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Margin positions are graphically displayed | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Ruler/status line shows line number | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Ruler/status line shows page number | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Ruler/status line shows filename | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Program shows current drive and path | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Ruler line shows DOS date and/or time | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Page breaks are shown while typing | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Paragraph markers are normally shown | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Text entry and editing | | | | | | | | | | |
| Status messages indicate special typing modes | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Insert and overwrite modes are available | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Dating | | | | | | | | | | |
| Entire word | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Entire line | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Sentence | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Paragraph | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Page | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Column | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Undelete capability | | | | | | | | | | |
| Multiple undelete levels | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Mouse-controlled cursor | | | | | | | | | | |
| Word block | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Line block | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Sentence block | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Paragraph block | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Column block | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

(continues)

Inside the revolution



NBI, Inc. Model 908



QMS-PS* 800
QMS-PS* 800+
QMS-PS* 800 II



Linotype Company Linotronic* 100
Linotype Company Linotronic* 300



Digital Equipment Corp.
ScriptPrinter*



Qume Corporation ScriptEN*



Diconix Diji* I/PS



AST Turbo Laser* I/PS



IBM 4216-020 Personal Pageprinter*



Texas Instruments OmniLaser* 2108



Varityper VT-600



Wang LCS 15*



Agfa-Gevaert P400PS*



The Laser Connection PS Jet/PS Jet+*



NEC Information Systems
SilentWriter* LC-890



QMS-PS* 2400*



Apollo Computer Inc.
Domain/Laser 26**

e printers a is going on.



Digital Equipment Corp. PrintServer 40™



Texas Instruments OmniLaser™ 2115



DataProducts Corp. L2R™ 2665

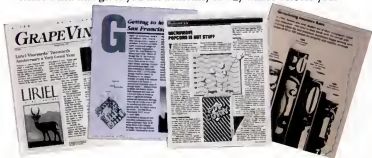


Apple Computer Inc. LaserWriter®
Apple Computer Inc. LaserWriter® Plus

POSTSCRIPT® from Adobe Systems started a revolution in business communications. That's why you'll find POSTSCRIPT in virtually every popular laser printer sold today.

POSTSCRIPT, the page description language, is the unanimous choice for some very good reasons. POSTSCRIPT gives you the option of printing from an IBM® PC, Macintosh®, or mini/mainframe.

With so many printers to choose from, you won't be tied to a single vendor. And that gives you the flexibility to buy what's best for your



company's needs. Since POSTSCRIPT is device independent, you can design a document, then professionally print it later at a higher resolution.

You can also choose from hundreds of software programs supporting POSTSCRIPT. And POSTSCRIPT lets you combine text, line art, and even digitized photographs on the same page.

POSTSCRIPT from Adobe Systems. The only two names you need to know to join the communication revolution.

Ask for a demonstration on the POSTSCRIPT printer of your choice. With so many to choose from, the hardest decision you may face is which POSTSCRIPT printer to buy.

ADOBE
SYSTEMS INCORPORATED

POSTSCRIPT from Adobe.
The Magic Behind Desktop Publishing.

All products are registered trademarks and trademarks of their manufacturers.

CIRCLE 725 ON READER SERVICE CARD



Word Processors: Summary of Features

(Products listed in alphabetical order)

| Product name | Allegory | Book Street Writer Plus | Command-Writer | Cot & Paste | Doc Easy Word II | DisplayWrite Assistant | DisplayWrite 4 | Easy Extra | Einstain-Writer |
|--|----------|-------------------------|----------------|-------------|------------------|------------------------|----------------|------------|-----------------|
| List price | \$395.00 | \$79.95 | \$150.00 | \$14.95 | \$49.95 | \$195.00 | \$495.00 | \$99.00 | \$75.00 |
| Price of upgrade | \$29.95 | \$30.00 | \$10.00 | N/A | N/A | N/A | \$75.00 | N/A | N/A |
| Text entry and editing | | | | | | | | | |
| Page block | ● | ○ | ● | ○ | ○ | ● | ○ | ○ | ○ |
| Block can be extended | ● | ● | ● | ○ | ○ | ○ | ○ | ○ | ○ |
| Move block | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Copy block | ● | ● | ● | ○ | ● | ● | ● | ● | ● |
| Delete block | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Reformats automatically after block move | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Copies or moves to another window | ● | ○ | ● | ○ | ● | ○ | ● | ○ | ● |
| Copies or moves to end from footnote | ○ | ○ | ○ | ○ | ○ | ○ | ● | ○ | ○ |
| Saves to a file | ○ | ● | ● | ○ | ○ | ● | ● | ○ | ● |
| Appends to a separate file | ○ | ● | ○ | ○ | ○ | ● | ○ | ○ | ○ |
| Search-and-replace | | | | | | | | | |
| Works forward and backward | ● | ○ | ● | ○ | ○ | ○ | ○ | ○ | ● |
| Verifies replace | ● | ● | ○ | ○ | ● | ● | ● | ○ | ● |
| Searches within other files | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Performs case-sensitive search | ● | ○ | ● | ○ | ○ | ○ | ○ | ○ | ○ |
| Preserves case when replacing | ○ | ○ | ○ | ○ | ○ | ○ | ● | ○ | ○ |
| Recognizes whole words | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Uses wildcards | ○ | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Search-and-replace for format codes | ● | ○ | ○ | ○ | ○ | ○ | ● | ○ | ● |
| Text windows | | | | | | | | | |
| No. of windows | 2 | N/A | 3 | N/A | 4 | N/A | N/A | N/A | N/A |
| Split-screen windows | ● | N/A | ● | N/A | ● | N/A | N/A | N/A | N/A |
| Full-screen windows | ● | N/A | ● | N/A | ● | N/A | N/A | N/A | N/A |
| Printer | | | | | | | | | |
| No. of printer drivers | 150 | 1 | 69 | 1 | 234 | None | 9 | 254 | 41 |
| Can modify printer drivers | ● | ● | ○ | ○ | ● | ○ | ● | ● | ○ |
| Can work with more than one printer | ● | ● | ○ | ● | ● | ○ | ● | ● | ○ |
| Edits while printing | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ● |
| Queues documents for printing | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Can change print queue | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Prints block | ○ | ● | ○ | ○ | ● | ○ | ○ | ○ | ● |
| Prints continuous range of pages | ● | ○ | ● | ○ | ○ | ● | ○ | ○ | ○ |
| Prints selected pages | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Prints as you type | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| High-order ASCII characters | ● | ● | ○ | ○ | ● | ● | ● | ○ | ○ |
| Automatic envelope formatting and printing | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Landscape mode | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| File handling | | | | | | | | | |
| Entire document kept in RAM | ● | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Maximum file size | 300K | 30K | Unlimited | 32K | 500K | 32K | 2.4MB | 255K | 60K |
| Creates .BAK file | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Makes backup during save and resume | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Temporarily goes to DOS | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Includes file management functions | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Can search disk for a filename | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| File import/export | | | | | | | | | |
| Accepts DCA files | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Accepts WordStar files | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Accepts WordPerfect files | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Accepts Microsoft Word files | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Accepts MultiMate files | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

■ Indicates Editor's Choice ● Yes ○ No N/A—Not applicable, program does not have this feature.

| Product name | The Executive Footwriter | The Executive Secretary | Executive Writer | Final Draft | Final Word II | Friendly-Ware | Galaxy | Harmony | Leading Edge Word Processing |
|------------------|--------------------------|-------------------------|------------------|-------------|---------------|---------------|---------|----------|------------------------------|
| List price | \$69.95 | \$159.95 | \$69.95 | \$195.00 | \$395.00 | \$49.95 | \$49.95 | \$149.00 | \$195.00 |
| Price of upgrade | \$30.00 | \$7.50 | N/A | \$195.00 | \$38.00 | N/A | N/A | Varies | \$100.00 |

Text entry and editing

| | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|
| Page block | ○ | ○ | ○ | ○ | ● | ○ | ○ | ○ | ○ |
| Block can be extended | ○ | ○ | ○ | ○ | ○ | ● | ○ | ○ | ● |
| Move block | ● | ● | ● | ● | ○ | ● | ● | ● | ● |
| Copy block | ● | ● | ● | ● | ○ | ● | ● | ● | ● |
| Delete block | ● | ● | ● | ● | ○ | ● | ● | ● | ● |
| Italics automatically after block move | ○ | ● | ● | ● | ○ | ○ | ○ | ● | ● |
| Copies or moves to another window | ○ | ○ | ○ | ○ | ● | ○ | ● | ○ | ● |
| Copies or moves to and from footnotes | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Saves to a file | ● | ● | ● | ● | ○ | ○ | ● | ● | ● |
| Appends to a separate file | ○ | ○ | ○ | ○ | ● | ○ | ○ | ○ | ● |

| | | | | | | | | | |
|-------------------------------------|---|---|---|---|---|---|---|---|---|
| Search-and-replace | ○ | ○ | ● | ○ | ● | ● | ● | ○ | ● |
| Works forward and backward | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Verifies replace | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Searches within other files | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Performs case-sensitive search | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Preserves case when replacing | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Recognizes whole words | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Uses wildcards | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Search-and-replace for format codes | ● | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

| | | | | | | | | | |
|----------------------|-----|---|-----|-----|---|-----|---|-----|---|
| Text windows | | | | | | | | | |
| No. of windows | N/A | 1 | N/A | N/A | 6 | N/A | 2 | N/A | 2 |
| Split-screen windows | N/A | ○ | N/A | N/A | ○ | N/A | ● | N/A | ● |
| Full-screen windows | N/A | ● | N/A | N/A | ● | N/A | ● | N/A | ○ |

Printer

| | | | | | | | | | |
|--|----|---|----|----|---|----------|----|----|-----|
| No. of printer drivers | 16 | 9 | 12 | 33 | 8 | 250 plus | 32 | 50 | 150 |
| Can modify printer drivers | ● | ○ | ● | ● | ○ | ○ | ● | ● | ○ |
| Can work with more than one printer | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Edits while printing | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Queues documents for printing | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Can change print queue | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Prints block | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Prints continuous range of pages | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Prints selected pages | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Prints as you type | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| High-order ASCII characters | ● | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Automatic envelope formatting and printing | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Landscape mode | ● | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

File handling

| | | | | | | | | | |
|-------------------------------------|-----|-----|-----|-----------|------|-----|-----------|----------|-----------|
| Entire document kept in RAM | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Maximum file size | 24K | 24K | 20K | Unlimited | 512K | 20K | Unlimited | 30MB | Unlimited |
| Creates .BAK file | ○ | ○ | ○ | ○ | ○ | ○ | ○ | Optional | Optional |
| Makes backup during save and resume | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Temporarily goes to DOS | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Includes file management functions | ● | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Can search disk for a filename | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| File import/export | | | | | | | | | |
| Accepts DCA files | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Accepts WordStar files | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Accepts WordPerfect files | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Accepts Microsoft Word files | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Accepts MultiMate files | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

(continues)



Word Processors: Summary of Features

(Products listed in alphabetical order)

| Product name | Lesitype Plus II | MASS-11 Word Processor | Microsoft Windows Write | Microsoft Word | MindReader | MultiMate Advantage II | My Word! | New York Word | Nova Bene |
|--|------------------|------------------------|-------------------------|----------------|------------|------------------------|-------------------|---------------|-----------|
| List price | \$495.00 | \$395.00 | \$99.00 | \$450.00 | \$49.95 | \$565.00 | \$49.00 | \$45.00 | \$495.00 |
| Price of upgrade | \$100.00 | \$100.00 | N/A | \$75.00 | \$29.95 | \$100.00 | \$5.00 or \$25.00 | \$15.00 | \$50.00 |
| Text entry and editing | | | | | | | | | |
| Page block | ○ | ● | ○ | ○ | ○ | ● | ○ | ○ | ○ |
| Block can be extended | ○ | ● | ● | ● | ○ | ● | ○ | ○ | ○ |
| Move block | ● | ● | ● | ○ | ● | ● | ○ | ● | ● |
| Copy block | ● | ● | ● | ○ | ● | ● | ○ | ● | ● |
| Delete block | ○ | ● | ● | ● | ○ | ● | ● | ○ | ● |
| Reformats automatically after block move | ○ | ● | ● | ○ | ○ | ● | ○ | ○ | ● |
| Copies or moves to another window | ○ | ● | ● | ● | ○ | ○ | ○ | ● | ● |
| Copies or moves to and from footnotes | ○ | ● | ○ | ● | ○ | ● | ○ | ● | ● |
| Saves to a file | ● | ○ | ○ | ● | ● | ● | ● | ● | ● |
| Appends to a separate file | ● | ○ | ○ | ○ | ● | ● | ○ | ○ | ● |
| Search-and-replace | | | | | | | | | |
| Works forward and backward | ○ | ● | ○ | ○ | ○ | ● | ○ | ● | ● |
| Verifies replace | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Searches within other files | ○ | ● | ○ | ● | ○ | ○ | ○ | ○ | ● |
| Performs case-sensitive search | ○ | ○ | ● | ● | ○ | ● | ○ | ○ | ● |
| Preserves case when replacing | ○ | ● | ● | ● | ○ | ○ | ○ | ○ | ● |
| Recognizes whole words | ○ | ● | ● | ● | ○ | ○ | ○ | ○ | ● |
| Uses wildcard | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Search-and-replace for format codes | ○ | ○ | ○ | ● | ○ | ● | ● | ○ | ● |
| Text windows | | | | | | | | | |
| No. of windows | N/A | 2 | 7 | 8 | 2 | N/A | N/A | 12 | 9 |
| Split-screen windows | N/A | ● | ● | ● | ● | N/A | N/A | ● | ● |
| Full-screen windows | N/A | ○ | ● | ● | ○ | N/A | N/A | ● | ● |
| Printer | | | | | | | | | |
| No. of printer drivers | 50 | 127 | 16 | 140 | 2 | 77 | 4 | 15 | 125 |
| Can modify printer drivers | ● | ○ | ○ | ● | ○ | ● | ● | ● | ● |
| Can work with more than one printer | ● | ● | ○ | ● | ○ | ● | ○ | ● | ● |
| Edits while printing | ● | ○ | ● | ● | ○ | ○ | ○ | ○ | ● |
| Queues documents for printing | ● | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Can change print queue | ○ | ○ | ● | ○ | ○ | ○ | ○ | ○ | ○ |
| Prints block | ● | ○ | ○ | ● | ○ | ○ | ○ | ○ | ○ |
| Prints continuous range of pages | ● | ● | ● | ○ | ○ | ● | ○ | ○ | ○ |
| Prints selected pages | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Prints as you type | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| High-order ASCII characters | ○ | ● | ● | ○ | ○ | ○ | ○ | ○ | ○ |
| Automatic envelope formatting and printing | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Landscape mode | ● | ○ | ● | ● | ○ | ● | ● | ● | ○ |
| File handling | | | | | | | | | |
| Entire document kept in RAM | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Maximum file size | 360K | Unlimited | Unlimited | Unlimited | 41K | 128K | 4,748K | Unlimited | Unlimited |
| Creates .BAK file | ○ | Optional | Optional | ● | ○ | Optional | ○ | ○ | ○ |
| Makes backup during save and resume | ○ | Optional | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Temporarily goes to DOS | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Includes file management functions | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Can search disk for a filename | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| File import/export | | | | | | | | | |
| Accepts DCA files | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Accepts WordStar files | ○ | ○ | ○ | Optional | ○ | ○ | ○ | ○ | ○ |
| Accepts WordPerfect files | ○ | ○ | ○ | Optional | ○ | ○ | ○ | ○ | Optional |
| Accepts Microsoft Word files | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | Optional |
| Accepts MultiMate files | ○ | ○ | ○ | Optional | ○ | ○ | ○ | ○ | Optional |

PC — Indicates Editor's Choice ● — Yes ○ — No N/A — Not applicable; program does not have this feature

| Product name | OfficeWriter | Palatir
Word
Processor | Paperback
Writer | PC-Type
Plus | PC-Write | Personal
QWERTY | Personal
WordPerfect | PFS:
Professional
Write | PractiWord |
|------------------|--------------|------------------------------|---------------------|-----------------|----------|--------------------|-------------------------|-------------------------------|------------|
| List price | \$495.00 | \$395.00 | \$39.95 | \$69.95 | \$16.00 | \$99.00 | \$195.00 | \$199.00 | \$99.95 |
| Price of upgrade | \$75.00 | \$100.00 | N/A | \$25.00 | \$25.00 | \$15.00 | N/A | N/A | \$15.00 |

Text entry and editing

| | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|
| Page block | ● | ● | ○ | ○ | ● | ○ | ● | ○ | ● |
| Block can be extended | ○ | ● | ○ | ● | ● | ● | ● | ● | ● |
| Move block | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Copy block | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Delete block | ● | ● | ● | ● | ○ | ● | ● | ● | ● |
| Reformats automatically after block move | ● | ● | ○ | ○ | ● | ● | ● | ● | ● |
| Copies or moves to another window | ● | ○ | ○ | ● | ● | ○ | ○ | ○ | ○ |
| Copies or moves to and from footnotes | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ● |
| Saves to a file | ● | ● | ○ | ● | ● | ● | ○ | ● | ● |
| Appends to a separate file | ● | ○ | ○ | ● | ● | ● | ○ | ○ | ● |

Search-and-replace

| | | | | | | | | | |
|-------------------------------------|---|---|---|---|---|---|---|---|---|
| Works forward and backward | ○ | ● | ○ | ● | ● | ● | ● | ○ | ● |
| Verifies replace | ● | ● | ● | ● | ○ | ○ | ○ | ○ | ● |
| Searches within other files | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Performs case-sensitive search | ● | ● | ○ | ○ | ○ | ○ | ○ | ○ | ● |
| Preserves case when replacing | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Recognizes whole words | ○ | ● | ○ | ○ | ○ | ○ | ○ | ○ | ● |
| Uses wildcards | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Search-and-replace for format codes | ● | ● | ● | ○ | ● | ● | ● | ○ | ○ |

Text windows

| | | | | | | | | | |
|----------------------|-----|-----|-----|----|---|-----|---|-----|-----|
| No. of windows | N/A | N/A | N/A | 10 | 2 | N/A | 1 | N/A | N/A |
| Split-screen windows | N/A | N/A | N/A | ○ | ○ | N/A | ○ | N/A | N/A |
| Fold-screen windows | N/A | N/A | N/A | ● | ○ | N/A | ○ | N/A | N/A |

Printer

| | | | | | | | | | |
|--|-----|----|------|---|-----|---|-----|----|----|
| No. of printer drivers | 250 | 45 | None | 9 | 350 | 1 | 300 | 66 | 26 |
| Can modify printer drivers | ● | ○ | ○ | ● | ● | ● | ● | ● | ● |
| Can work with more than one printer | ● | ● | ○ | ○ | ○ | ○ | ● | ○ | ○ |
| Edits while printing | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Queues documents for printing | ● | ○ | ○ | ○ | ○ | ○ | ● | ○ | ○ |
| Can change print queue | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Prints block | ○ | ○ | ○ | ○ | ○ | ○ | ● | ○ | ○ |
| Prints continuous range of pages | ● | ● | ○ | ○ | ○ | ● | ○ | ○ | ● |
| Prints selected pages | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Prints as you type | ○ | ● | ○ | ○ | ○ | ● | ○ | ○ | ○ |
| High-order ASCII characters | ○ | ● | ○ | ○ | ○ | ● | ○ | ○ | ○ |
| Automatic envelope formatting and printing | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Landscape mode | ○ | ○ | ○ | ○ | ● | ○ | ○ | ○ | ○ |

File handling

| | | | | | | | | | |
|-------------------------------------|------|-----------|-----|-----------|------|-----|-----------|-----|-----------|
| Entire document kept in RAM | ● | ○ | ● | ● | ● | ● | ● | ○ | ○ |
| Maximum file size | 240K | Unlimited | 20K | Unlimited | 640K | 43K | Unlimited | 64K | Unlimited |
| Creates .BAK file | ○ | ○ | ● | Optional | ○ | ○ | ○ | ○ | ● |
| Makes backup during save and resume | ○ | ● | ● | Optional | ● | ○ | ● | ○ | ● |
| Temporarily goes to DOS | ● | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Includes file management functions | ● | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Can search disk for a filename | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| File Import/export | | | | | | | | | |
| Accepts DCA files | ● | ○ | ○ | ○ | ● | ○ | ● | ○ | ○ |
| Accepts WordStar files | ○ | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Accepts WordPerfect files | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Accepts Microsoft Word files | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Accepts MultiMate files | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

(continues)



Word Processors: Summary of Features

(Products listed in alphabetical order)

| Product name | Professional Writer's Package | Q&A Write | R Word Plus | Semna Plus IV | Textre Version 4.0, \$29.95, 5.0 \$69.95 Price includes 3 upgrades | Typist | Vantec Word | Vantec Script | Volkswriter Deluxe Plus |
|--|-------------------------------|-----------|-------------|---------------|--|---------|-------------|---------------|-------------------------|
| List price | \$490.00 | \$199.00 | \$495.00 | \$695.00 | | \$45.00 | \$119.99 | \$99.95 | \$99.00 |
| Price of upgrade | \$35.00 | N/A | \$25.00 | \$30.00 | | N/A | \$65.00 | N/A | \$45.00 |
| Text entry and editing | | | | | | | | | |
| Page block | ○ | ● | ● | ● | ● | ○ | ○ | ● | ○ |
| Block can be extended | ○ | ● | ● | ● | ● | ○ | ○ | ● | ○ |
| Move block | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Copy block | ● | ● | ● | ● | ● | ○ | ● | ● | ● |
| Delete block | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Reformat automatically after block move | ○ | ● | ● | ● | ● | ● | ● | ● | ○ |
| Copies or moves to another window | ● | ○ | ○ | ● | ○ | ○ | ● | ● | ○ |
| Copies or moves to and from footnote | ● | ○ | ● | ● | ○ | ○ | ○ | ● | ○ |
| Save to a file | ● | ● | ● | ● | ● | ● | ○ | ○ | ● |
| Append to a separate file | ● | ○ | ○ | ● | ○ | ○ | ○ | ○ | ● |
| Search-and-replace | | | | | | | | | |
| Works forward and backward | ● | ● | ○ | ● | ● | ○ | ● | ○ | ○ |
| Verifies replace | ● | ● | ● | ● | ● | ● | ● | ○ | ○ |
| Searches within other files | ● | ○ | ○ | ● | ○ | ○ | ○ | ○ | ○ |
| Performs case-sensitive search | ● | ○ | ● | ● | ○ | ○ | ● | ○ | ○ |
| Preserves case when replacing | ○ | ● | ● | ● | ● | ○ | ○ | ● | ● |
| Recognizes whole words | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Uses wildcards | ○ | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Search-and-replace for format codes | ○ | ● | ○ | ● | ○ | ○ | ○ | ○ | ● |
| Text windows | | | | | | | | | |
| No. of windows | 4 | N/A | N/A | 2 | N/A | N/A | 2 | 2 | N/A |
| Split-screen windows | ● | N/A | N/A | ● | N/A | N/A | ● | ○ | N/A |
| Full-screen windows | ○ | N/A | N/A | ○ | N/A | N/A | ○ | ○ | N/A |
| Printer | | | | | | | | | |
| No. of printer drivers | Unlimited | 150 | 41 | 175 | None | 18 | 23 | 56 | 98 |
| Can modify printer drivers | Unlimited | ○ | ● | ○ | ○ | ○ | ● | ● | ○ |
| Can work with more than one printer | ○ | ○ | ○ | ● | ○ | ○ | ● | ○ | ○ |
| Edits while printing | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Queues documents for printing | ○ | ○ | ● | ● | ○ | ○ | ● | ○ | ○ |
| Can change print queue | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Prints block | ● | ● | ○ | ● | ● | ○ | ● | ○ | ○ |
| Prints continuous range of pages | ○ | ○ | ● | ○ | ○ | ○ | ● | ○ | ○ |
| Prints selected pages | ○ | ○ | ● | ○ | ○ | ○ | ○ | ○ | ○ |
| Prints as you type | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| High-order ASCII characters | ● | ○ | ○ | ○ | ● | ○ | ○ | ○ | ○ |
| Automatic envelope formatting and printing | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Landscape mode | ○ | ● | ○ | ● | ○ | ○ | ○ | ○ | ● |
| File handling | | | | | | | | | |
| Entire document kept in RAM | ● | ● | ○ | ● | ● | ○ | ○ | ○ | ○ |
| Maximum file size | Unlimited | 640K | Unlimited | Unlimited | 640K | 64K | Unlimited | 64K | Unlimited |
| Creates .BAK file | Optional | ○ | ○ | Optional | ○ | ○ | Optional | Optional | Optional |
| Makes backup during save and resume | Optional | ○ | ○ | Optional | ○ | ○ | Optional | Optional | Optional |
| Temporarily goes to DOS | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Included file management functions | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Can search disk for a filename | ○ | ● | ● | ○ | ○ | ○ | ○ | ○ | ○ |
| File import/export | | | | | | | | | |
| Accepts DCA files | ○ | ● | ○ | ● | ○ | ○ | ○ | ○ | ○ |
| Accepts WordStar files | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Accepts WordPerfect files | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Accepts Microsoft Word files | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Accepts MultiMate files | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

●—Indicates Editor's Choice ○—Yes ○—No N/A—Not applicable, program does not have this feature.

| Product name | Volta-
writer 3 | Webster's
NewWorld
Writer I | Word-
Perfect | WordStar
Profes-
sional | WordStar
2000 Plus
Upgrade
<small>Part 1 only</small> | WPS-PC | Write Now | Write 'n
Spell | XyWrite III
Plus | ZenWord |
|---|--------------------|-----------------------------------|------------------|-------------------------------|--|-----------|-----------|-------------------|---------------------|-----------|
| List price | \$295.00 | \$99.95 | \$495.00 | \$495.00 | \$495.00 | \$275.00 | \$150.00 | \$129.00 | \$445.00 | \$39.95 |
| Price of upgrade | \$95.00 | Free | \$35.00 | \$89.00 | \$89.00 | \$50.00 | N/A | N/A | \$50.00 | \$19.95 |
| Text entry and editing | | | | | | | | | | |
| Page block | ○ | ● | ● | ○ | ● | ○ | ○ | ● | ● | ○ |
| Block can be extended | ○ | ○ | ● | ○ | ● | ○ | ○ | ○ | ○ | ○ |
| Move block | ● | ● | ● | ● | ● | ● | ● | ● | ● | ○ |
| Copy block | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Delete block | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Reformats automatically after
block move | ● | ● | ○ | ○ | ● | ● | ● | ● | ● | ○ |
| Copies or moves to another window | ○ | ○ | ● | ○ | ● | ○ | ○ | ○ | ● | ○ |
| Copies or moves to end from footnotes | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Saves to a file | ● | ● | ● | ● | ● | ○ | ● | ● | ● | ● |
| Appends to a separate file | ● | ● | ○ | ○ | ● | ○ | ○ | ● | ● | ● |
| Search-and-replace | | | | | | | | | | |
| Works forward and backward | ○ | ● | ● | ● | ● | ○ | ○ | ○ | ○ | ○ |
| Verifies replace | ● | ● | ● | ● | ● | ● | ○ | ○ | ○ | ○ |
| Searches within other files | ○ | ○ | ● | ○ | ○ | ○ | ○ | ○ | ● | ○ |
| Performs case-sensitive search | ● | ● | ○ | ○ | ● | ● | ● | ● | ● | ● |
| Preserves case when replacing | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Recognizes whole words | ○ | ● | ○ | ● | ● | ○ | ○ | ○ | ○ | ○ |
| Uses wildcards | ○ | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Search-and-replace for format codes | ● | ○ | ● | ● | ● | ○ | ○ | ● | ● | ○ |
| Text windows | | | | | | | | | | |
| No. of windows | N/A | N/A | 2 | N/A | 3 | N/A | N/A | N/A | 9 | N/A |
| Split-screen windows | N/A | N/A | ● | N/A | ○ | N/A | N/A | N/A | ● | N/A |
| Full-screen windows | N/A | N/A | ○ | N/A | ○ | N/A | N/A | N/A | ○ | N/A |
| Printer | | | | | | | | | | |
| No. of printer drivers | 140 | 24 | 300 | 59 | 59 | 34 | 19 | 24 | 160 | 44 |
| Can modify printer drivers | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Can work with more than one printer | ● | ● | ● | ● | ● | ○ | ○ | ○ | ○ | ○ |
| Edits while printing | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Queues documents for printing | ● | ○ | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Can change print queue | ● | ○ | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Prints block | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Prints continuous range of pages | ● | ● | ● | ● | ○ | ○ | ○ | ○ | ○ | ○ |
| Prints selected pages | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Prints as you type | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| High-order ASCII characters | ○ | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Automatic envelope formatting and
printing | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Landscape mode | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| File handling | | | | | | | | | | |
| Entire document kept in RAM | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Maximum file size | 1MB | Unlimited | Unlimited | 4MB | Unlimited | Unlimited | 64K | 350K | Unlimited | Unlimited |
| Creates .BAK file | Optional | ○ | ○ | ○ | ○ | Optional | ○ | ○ | Optional | Optional |
| Makes backup during save and resume | Optional | ○ | ○ | ○ | ○ | Optional | ○ | ○ | Optional | Optional |
| Temporarily goes to DOS | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Includes file management functions | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Can search disk for a filename | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| File import/export | | | | | | | | | | |
| Accepts DCA files | ○ | ○ | ○ | ○ | ○ | Optional | ○ | ○ | ○ | ○ |
| Accepts WordStar files | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Accepts WordPerfect files | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Accepts Microsoft Word files | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Accepts MultiMate files | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

(continues)



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Word Processors: Summary of Features

(Products listed in alphabetical order)

| Product name | Allegory | Bank Street Writer Plus | Command-Writer | Cut & Paste | Dec Easy Word II | DisplayWrite Assistant | DisplayWrite 4 | Easy Extra | Einstein-Writer |
|---|-----------------|-------------------------|----------------|-------------|------------------|------------------------|----------------|----------------------|-----------------|
| List price | \$395.00 | \$79.95 | \$150.00 | \$14.95 | \$49.95 | \$195.00 | \$495.00 | \$99.00 | \$75.00 |
| Price of upgrade | \$29.95 | \$30.00 | \$10.00 | N/A | N/A | N/A | \$75.00 | N/A | N/A |
| Spelling checker, hyphenation, thesaurus | | | | | | | | | |
| Spelling checker | ● | ● | ● | ○ | ● | ● | ● | ● | ● |
| No. of words in standard dictionary | 80,000 | 60,000 | 100,000 | N/A | 80,000 | 125,000 | 125,000 | 87,000 | 75,000 |
| Dictionary size | 220K | 100K | 52K | N/A | 170K | 164K | 164K | 303K | 200K |
| Dictionary developer | Merriam Webster | Merriam Webster | Oasis Systems | In-house | In-house | WordPerfect Corp. | In-house | Houghton Mifflin Co. | In-house |
| No. of user dictionaries | 1 | 1 | Unlimited | N/A | 1 | 2 | Unlimited | Unlimited | 1 |
| Spell-checks single word | ● | ● | ● | N/A | ○ | ● | ● | ○ | ○ |
| Spell-checks defined block | ● | ○ | ○ | N/A | ○ | ● | ● | ○ | ○ |
| Check-as-you-type option | ○ | ○ | ○ | N/A | ○ | ○ | ○ | ○ | ○ |
| Specialized spelling checkers | | | | | | | | | |
| Legal | Optional | ○ | ○ | N/A | ○ | ○ | ● | Optional | ○ |
| Medical | Optional | ○ | ○ | N/A | ○ | ○ | ● | Optional | ○ |
| Other | ● | ○ | ○ | N/A | ○ | ○ | ○ | ● | ○ |
| Hyphenation | | | | | | | | | |
| Based on algorithm or dictionary | N/A | N/A | Algorithm | N/A | Algorithm | Algorithm | Dictionary | N/A | N/A |
| Uses hot zone for hyphenation | N/A | N/A | ● | N/A | ○ | ● | ● | ● | ○ |
| Inserts soft hyphens | ○ | ○ | ● | ○ | ● | ● | ● | ○ | ○ |
| Allows entering soft hyphens from keyboard | ● | ○ | ○ | ○ | ● | ● | ○ | ○ | ○ |
| Readjusts to additions and deletions | ○ | ○ | ● | ○ | ● | ● | ● | ○ | ○ |
| Thesaurus | | | | | | | | | |
| Thesaurus provided | ○ | ● | ○ | ○ | ○ | ● | ○ | ○ | ○ |
| Antonym provided | N/A | ● | N/A | N/A | N/A | ○ | N/A | N/A | N/A |
| Manuscript preparation | | | | | | | | | |
| Footnotes and endnotes | | | | | | | | | |
| Includes footnote/endnote capability | ○ | ○ | ● | ○ | ○ | ○ | ● | ○ | ○ |
| Different fonts | N/A | N/A | ● | N/A | N/A | N/A | ● | N/A | N/A |
| Auto-numbering | N/A | N/A | ● | N/A | N/A | N/A | ● | N/A | N/A |
| Indexing | | | | | | | | | |
| Includes indexing capability | ○ | ○ | ● | ○ | ○ | ○ | ○ | ○ | ○ |
| Multilevel indexing | N/A | N/A | ○ | N/A | N/A | N/A | N/A | N/A | N/A |
| Table of contents | ○ | ○ | ● | ○ | ○ | ○ | ○ | ○ | ○ |
| Multilevel formats | N/A | N/A | ● | N/A | N/A | N/A | N/A | N/A | N/A |
| Desktop publishing features | | | | | | | | | |
| Smoking columns | ○ | ○ | ● | ○ | ○ | ○ | ○ | ○ | ○ |
| Single and smoking columns on same page | N/A | N/A | ● | N/A | N/A | N/A | N/A | N/A | N/A |
| Maximum no. of columns | N/A | N/A | Unlimited | N/A | N/A | N/A | N/A | N/A | N/A |
| Full justification and microjustification | N/A | N/A | ● | N/A | N/A | N/A | N/A | N/A | N/A |
| Automatic calculation of placement and width | N/A | N/A | ○ | N/A | N/A | N/A | N/A | N/A | N/A |
| Side-by-side columns | | | | | | | | | |
| Maximum no. of columns | ○ | ○ | ● | ○ | ○ | ○ | ● | ○ | ○ |
| Full justification and microjustification | N/A | N/A | ● | N/A | N/A | N/A | ● | N/A | N/A |
| Unmatched column widths available | N/A | N/A | ● | N/A | N/A | N/A | ● | N/A | N/A |
| Adjustable gutter width | N/A | N/A | ● | N/A | N/A | N/A | ● | N/A | N/A |
| Single column automatically restored | N/A | N/A | ● | N/A | N/A | N/A | ○ | N/A | N/A |
| Line graphics | | | | | | | | | |
| Erascible line graphics | ○ | ○ | ○ | ○ | ○ | ● | ● | ○ | ○ |
| Dynamic graphics | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Ability to import graphics-format files | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Graphics preview | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Page preview | ● | ● | ● | ○ | N/A | ○ | ○ | ○ | ○ |

●—Indicates Editor's Choice ●—Yes ○—No N/A—Not applicable; program does not have this feature.

| Product name | The Executive Footwriter | The Executive Secretary | Executive Writer | Final Draft | Final Word II | Friendly-Were | Galaxy | Harmony | Leading Edge Word Processing |
|------------------|--------------------------|-------------------------|------------------|-------------|---------------|---------------|---------|----------|------------------------------|
| List price | \$69.95 | \$159.95 | \$69.95 | \$195.00 | \$195.00 | \$49.95 | \$49.95 | \$149.00 | \$195.00 |
| Price of upgrade | \$30.00 | \$7.50 | N/A | \$195.00 | \$38.00 | N/A | N/A | Varies | \$100.00 |

Spelling checker, hyphenation, thesaurus

| | | | | | | | | | |
|-------------------------------------|-----------|-----------|-----|-----------------|------------|----------|-----|-----------|----------------------|
| Spelling checker | Optional | ● | ○ | ● | ● | ● | ○ | ● | ● |
| No. of words in standard dictionary | 24,600 | 25,000 | N/A | 350,000 | 70,000 | 70,208 | N/A | 18,000 | 80,000 |
| Dictionary size | 131K | 130K | N/A | 222K | 137K | 139K | N/A | 76,129K | 222K |
| Dictionary developer | In-house | In-house | N/A | Merriam Webster | MicroSpell | In-house | N/A | In-house | Proximity Technology |
| No. of user dictionaries | Unlimited | Unlimited | N/A | 1 | 1 | 1 | N/A | Unlimited | 1 |
| Spell-checks single word | ○ | ○ | N/A | ○ | ● | ○ | N/A | ● | ○ |
| Spell-checks defined block | ○ | ○ | N/A | ○ | ○ | ○ | N/A | ○ | ○ |
| Check-as-you-type option | ○ | ○ | N/A | ○ | ● | ○ | N/A | ○ | ○ |

Specialized spelling checkers

| | | | | | | | | | |
|---------|---|---|-----|----------|---|---|-----|---|---|
| Legal | ○ | ○ | N/A | ○ | ○ | ○ | N/A | ○ | ○ |
| Medical | ○ | ○ | N/A | Optional | ○ | ○ | N/A | ○ | ○ |
| Other | ○ | ○ | N/A | ○ | ○ | ○ | N/A | ○ | ○ |

Hyphenation

| | | | | | | | | | |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Based on algorithm or dictionary | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Uses hot zone for hyphenation | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Inserts soft hyphens | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Allows entering soft hyphens from keyboard | ● | ● | ○ | ○ | ○ | ○ | ○ | ● | ○ |
| Readjusts to additions and deletions | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

| | | | | | | | | | |
|-------------------|-----|-----|-----|---|-----|-----|-----|-----|-----|
| Thesaurus | ○ | ○ | ○ | ● | ○ | ○ | ○ | ○ | ○ |
| Antonyms provided | N/A | N/A | N/A | ● | N/A | N/A | N/A | N/A | N/A |

Manuscript preparation

| | | | | | | | | | |
|--------------------------------------|---|---|---|---|---|-----|-----|-----|-----|
| Footnotes and endnotes | ● | ● | ● | ● | ● | ○ | ○ | ○ | ○ |
| Includes footnote/endnote capability | ○ | ○ | ○ | ○ | ● | N/A | N/A | N/A | N/A |
| Different fonts | ○ | ○ | ○ | ○ | ○ | N/A | N/A | N/A | N/A |
| Auto-numbering | ● | ● | ● | ○ | ● | N/A | N/A | N/A | N/A |

| | | | | | | | | | |
|-----------------------------|---|---|-----|---|---|-----|-----|-----|-----|
| Indexing | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Indexed indexing capability | ● | ● | ● | ● | ● | ○ | ○ | ○ | ○ |
| Multilevel indexing | ○ | ○ | ○ | ○ | ○ | N/A | N/A | N/A | N/A |
| Table of contents | ● | ● | ○ | ● | ● | ○ | ○ | ○ | ○ |
| Multilevel formats | ● | ● | N/A | ○ | ● | N/A | N/A | N/A | N/A |

Desktop publishing features

| | | | | | | | | | |
|--|-----|-----------|-----|-----|---|-----|-----|-----|-----|
| Shaking columns | ○ | ● | ○ | ○ | ● | ○ | ○ | ○ | ○ |
| Single and shaking columns on same page | N/A | ○ | N/A | N/A | ● | N/A | N/A | N/A | N/A |
| Maximum no. of columns | N/A | Unlimited | N/A | N/A | 6 | N/A | N/A | N/A | N/A |
| Full justification and microjustification | N/A | ● | N/A | N/A | ● | N/A | N/A | N/A | N/A |
| Automatic calculation of placement and width | N/A | ● | N/A | N/A | ● | N/A | N/A | N/A | N/A |

| | | | | | | | | | |
|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Side-by-side columns | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Maximum no. of columns | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Full justification and microjustification | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |

| | | | | | | | | | |
|--------------------------------------|-----|---|-----|-----|---|-----|-----|-----|-----|
| Unmatched column widths available | N/A | ○ | N/A | N/A | ○ | N/A | N/A | N/A | N/A |
| Adjustable gutter width | N/A | ● | N/A | N/A | ○ | N/A | N/A | N/A | N/A |
| Single column automatically restored | N/A | ● | N/A | N/A | ● | N/A | N/A | N/A | N/A |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Line graphics | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Erasable line graphics | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Dynamic graphics | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Ability to import graphics-format files | ○ | ○ | ● | ○ | ● | ○ | ○ | ○ | ● |
| Graphics preview | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Page preview | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

(continues)



Word Processors: Summary of Features

(Products listed in alphabetical order)

| Product name | Lextype Plus II | MASS-11 Word Processor | Microsoft Windows Write | Microsoft Word | MindReader | Multimate Advantage II | My Word! | New York Word | Notes Bene |
|---|-----------------|------------------------|-------------------------|----------------|------------|------------------------|-------------------|---------------|-------------|
| List price | \$495.00 | \$395.00 | \$99.00 | \$450.00 | \$49.95 | \$565.00 | \$49.00 | \$45.00 | \$495.00 |
| Price of upgrade | \$100.00 | \$100.00 | N/A | \$75.00 | \$29.95 | \$100.00 | \$5.00 or \$25.00 | \$15.00 | \$50.00 |
| Spelling checker, hyphenation, thesaurus | | | | | | | | | |
| Spelling checker | ● | ● | ○ | ● | ● | ● | ● | ● | ● |
| No. of words in standard dictionary | 45,000 | 100,000 | N/A | 130,000 | 2,700 | 110,000 | 60,000 | 100,000 | 100,000 |
| Dictionary size | 200K | 157K | N/A | 175K | 29K | 320K | 235K | 50K | 110K |
| Dictionary developer | In-house | In-house | N/A | SoftArt | In-house | Merriam Webster | In-house | In-house | Microlytics |
| No. of user dictionaries | Unlimited | Unlimited | N/A | Unlimited | 1 | Unlimited | Unlimited | Unlimited | Unlimited |
| Spell-checks single word | ○ | ○ | N/A | ● | ○ | ● | ○ | ○ | ○ |
| Spell-checks defined block | ○ | ○ | N/A | ● | ○ | ● | ○ | ○ | ○ |
| Check-as-you-type option | ○ | ○ | N/A | ○ | ● | ○ | ○ | ○ | ○ |
| Specialized spelling checkers | | | | | | | | | |
| Legal | ● | ○ | N/A | ○ | ○ | ● | ○ | ○ | ● |
| Medical | ○ | ○ | N/A | ○ | ○ | ● | ○ | ○ | ○ |
| Other | ● | ○ | N/A | ○ | ○ | ○ | ○ | ○ | ● |
| Hyphenation | | | | | | | | | |
| Based on algorithm or dictionary | N/A | Dictionary | N/A | Algorithm | N/A | Both | N/A | Algorithm | Both |
| Uses hot zone for hyphenation | ○ | ● | ○ | ○ | ○ | ● | ○ | ● | ● |
| Inserts soft hyphen | ○ | ● | ○ | ○ | ○ | ● | ○ | ● | ● |
| Allows entering soft hyphens from keyboard | ○ | ● | ○ | ● | ○ | ● | ○ | ○ | ● |
| Readjusts to additions and deletions | ○ | ● | ○ | ● | ○ | ● | ○ | ● | ● |
| Thesaurus | | | | | | | | | |
| Antonyms provided | N/A | N/A | N/A | ○ | N/A | ○ | N/A | N/A | ○ |
| Manuscript preparation | | | | | | | | | |
| Footnotes and endnotes | | | | | | | | | |
| Includes footnote/endnote capability | ● | ● | ○ | ● | ○ | ● | ○ | ● | ● |
| Different fonts | ● | ● | N/A | ● | N/A | ● | N/A | ● | ● |
| Auto-numbering | ○ | ● | N/A | ● | N/A | ● | N/A | ● | ● |
| Indexing | | | | | | | | | |
| Includes indexing capability | ○ | ● | ○ | ● | ○ | ○ | Optional | ● | ● |
| Multilevel indexing | N/A | ● | N/A | ● | N/A | N/A | ● | ● | ● |
| Table of contents | | | | | | | | | |
| Table of contents | ○ | ● | ○ | ● | ○ | ● | ● | ● | ● |
| Multilevel formats | N/A | ● | N/A | ● | N/A | ○ | ○ | ● | ● |
| Desktop publishing features | | | | | | | | | |
| Stacking columns | | | | | | | | | |
| Single and stacking columns on same page | N/A | ● | N/A | ● | N/A | ● | N/A | N/A | ○ |
| Maximum no. of columns | N/A | 30 | N/A | 19 | N/A | 8 | N/A | N/A | 6 |
| Full justification and microjustification | N/A | ● | N/A | ● | N/A | ● | N/A | N/A | ● |
| Automatic calculation of placement and width | N/A | ○ | N/A | ● | N/A | ● | N/A | N/A | ● |
| Side-by-side columns | | | | | | | | | |
| Maximum no. of columns | N/A | 30 | N/A | Unlimited | N/A | 8 | N/A | N/A | 8 |
| Full justification and microjustification | N/A | ● | N/A | ● | N/A | ● | N/A | N/A | ● |
| Unmatched column widths available | | | | | | | | | |
| Adjustable gutter width | N/A | ● | N/A | ● | N/A | ● | N/A | N/A | ● |
| Single column automatically restored | N/A | ● | N/A | ● | N/A | ● | N/A | N/A | ○ |
| Line graphics | | | | | | | | | |
| Erascable line graphics | ○ | ● | ○ | ● | ○ | ● | ○ | ● | ○ |
| Dynamic graphics | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Ability to import graphics-format files | ○ | ○ | ● | Optional | ○ | ○ | ○ | ○ | ○ |
| Graphics preview | ○ | ○ | ● | Optional | ○ | ○ | ○ | ○ | ○ |
| Page preview | | | | | | | | | |
| Page preview | ● | ● | ● | ○ | ○ | ● | ○ | ● | ● |

PC indicates Editor's Choice ●—Yes ○—No N/A—Not applicable, program does not have this feature

| Product name | OfficeWriter | Palenfir Word Processor | Paperback Writer | PC-Type Plus | PC-Write | Personal QWERTY | Personal WordPerfect | PFS: Professional Write | ProctiWord |
|---|-----------------|-------------------------|------------------|--------------|-----------|-----------------|----------------------|-------------------------|------------|
| List price | \$495.00 | \$395.00 | \$39.95 | \$69.95 | \$16.00 | \$99.00 | \$195.00 | \$199.00 | \$99.95 |
| Price of upgrade | \$75.00 | \$100.00 | N/A | \$25.00 | \$25.00 | \$15.00 | N/A | N/A | \$15.00 |
| Spelling checker, hyphenation, thesaurus | | | | | | | | | |
| Spelling checker | ● | ● | ○ | ● | ● | ○ | ● | ● | ○ |
| No. of words in standard dictionary | 80,000 | 80,000 | N/A | 100,000 | 50,000 | N/A | 100,000 | 77,000 | N/A |
| Dictionary size | 238K | 140K | N/A | 241K | 110K | N/A | 290K | 350K | N/A |
| Dictionary developer | Merriam Webster | Trigram | N/A | In-house | In-house | N/A | In-house | SoftArt | N/A |
| No. of user dictionaries | Unlimited | Unlimited | N/A | 1 | Unlimited | N/A | Unlimited | Unlimited | N/A |
| Spell-checks single word | ● | ○ | N/A | ● | ● | N/A | ● | ● | N/A |
| Spell-checks defined block | ● | ○ | N/A | ○ | ○ | N/A | ○ | ○ | N/A |
| Check-as-you-type option | ○ | ○ | N/A | ○ | ● | N/A | ○ | ○ | N/A |
| Specialized spelling checkers | | | | | | | | | |
| Legal | ● | ○ | N/A | ○ | ○ | N/A | ○ | ○ | N/A |
| Medical | ● | ○ | N/A | ○ | ○ | N/A | ○ | ○ | N/A |
| Other | ● | ○ | N/A | ○ | ○ | N/A | ○ | ○ | N/A |
| Hyphenation | | | | | | | | | |
| Based on algorithm or dictionary | Both | N/A | N/A | N/A | N/A | N/A | Algorithm | N/A | N/A |
| Uses hot zone for hyphenation | ● | ● | ○ | ○ | ○ | ○ | ● | ○ | ○ |
| Inserts soft hyphens | ● | ● | ○ | ○ | ● | ● | ● | ○ | ○ |
| Allows entering soft hyphens from keyboard | ● | ● | ○ | ○ | ● | ● | ○ | ○ | ○ |
| Readjusts to additions and deletions | ● | ○ | ○ | ○ | ○ | ● | ● | ○ | ○ |
| Thesaurus | | | | | | | | | |
| Antonyms provided | ● | N/A | N/A | N/A | N/A | N/A | ○ | ● | N/A |
| Manuscript preparation | | | | | | | | | |
| Footnotes and endnotes | | | | | | | | | |
| Includes footnote/endnote capability | ● | ○ | ○ | ○ | ● | ○ | ● | ○ | ○ |
| Different fonts | ● | N/A | N/A | N/A | N/A | N/A | ○ | N/A | N/A |
| Auto-numbering | ● | N/A | N/A | N/A | ● | N/A | ● | N/A | N/A |
| Indexing | | | | | | | | | |
| Includes indexing capability | ● | ○ | ○ | ○ | ○ | ● | ○ | ○ | ● |
| Multilevel indexing | ● | N/A | N/A | N/A | N/A | ○ | N/A | N/A | ● |
| Table of contents | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ● |
| Multilevel formats | ● | N/A | N/A | N/A | ○ | N/A | N/A | N/A | ● |
| Desktop publishing features | | | | | | | | | |
| Seeking columns | | | | | | | | | |
| Single and seeking columns on same page | ● | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Maximum no. of columns | 15 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Full justification and microjustification | ● | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Automatic calculation of placement and width | ○ | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Side-by-side columns | | | | | | | | | |
| Maximum no. of columns | ○ | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Full justification and microjustification | ○ | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Unmatched column widths available | | | | | | | | | |
| Adjustable gutter width | ● | N/A | N/A | N/A | ○ | N/A | N/A | N/A | N/A |
| Single column automatically restored | ● | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Line graphics | | | | | | | | | |
| Erasable line graphics | ● | ○ | ○ | ● | ○ | ● | ○ | ● | ○ |
| Dynamic graphics | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Ability to import graphics-format files | ● | ○ | ○ | ● | ○ | ○ | ○ | ● | ○ |
| Graphics preview | ● | ○ | ○ | ● | ○ | ○ | ○ | ○ | ○ |
| Page preview | ○ | ○ | ○ | ○ | ● | ○ | ○ | ● | ○ |

(continues)



Word Processors: Summary of Features

(Products listed in alphabetical order)

| Product name | Professional
Writer's
Package | Q&A
Write | R Word
Plus | Semco
Plus IV | Tetra
Version 4.0:
\$29.95
\$5.00 \$49.95
Price includes
3 upgrades | Typist | Ventex
Word | Varsity
Script II | Volkswriter
Deluxe
Plus |
|---|-------------------------------------|--------------|----------------|------------------|--|----------|----------------|----------------------|-------------------------------|
| List price | \$450.00 | \$199.00 | \$495.00 | \$695.00 | | \$45.00 | \$119.99 | \$99.95 | \$99.00 |
| Price of upgrade | \$35.00 | N/A | \$25.00 | \$30.00 | | N/A | \$65.00 | N/A | \$45.00 |
| Spelling checker, hyphenation, thesaurus | | | | | | | | | |
| Spelling checker | ● | ● | ● | ● | Optional | ● | ● | ● | ● |
| No. of words in standard dictionary | 66,000 | 100,000 | 100,000 | 60,000 | 75,000 | 26,000 | 90,000 | 67,000 | 100,000 |
| Dictionary size | 122K | 126,720K | 144K | 260K | 190K | 117K | 338K | 228K | 124K |
| Dictionary developer | In-house | Microlytics | In-house | In-house | In-house | In-house | In-house | Houghton
Mifflin | In-house |
| No. of user dictionaries | Unlimited | Unlimited | 1 | Unlimited | 3 | 1 | 1 | 1 | 1 |
| Spell-checks single word | ○ | ● | ○ | ○ | ● | ● | ○ | ○ | ● |
| Spell-checks defined block | ○ | ○ | ○ | ○ | ● | ○ | ○ | ● | ● |
| Check-as-you-type option | ○ | ○ | ○ | ○ | ○ | ● | ○ | ○ | ○ |
| Specialized spelling checkers | | | | | | | | | |
| Legal | ○ | ○ | ○ | Optional | ○ | ○ | ○ | ○ | ○ |
| Medical | ○ | ○ | ○ | Optional | ○ | ○ | ○ | ○ | ○ |
| Other | ○ | ○ | ○ | ● | ○ | ○ | ○ | ○ | ○ |
| Hyphenation | | | | | | | | | |
| Based on algorithm or dictionary | Algorithm | Dictionary | Dictionary | Dictionary | Dictionary | N/A | N/A | Dictionary | N/A |
| Uses hot zone for hyphenation | ● | ○ | ● | ● | ○ | ○ | ○ | ● | ○ |
| Inserts soft hyphens | ● | ● | ● | ○ | ○ | ○ | ○ | ● | ○ |
| Allows entering soft hyphens from keyboard | ● | ● | ● | ○ | ○ | ○ | ○ | ● | ○ |
| Readjusts to additions and deletions | ● | ○ | ○ | ● | ○ | ○ | ○ | ○ | ○ |
| Thesaurus | | | | | | | | | |
| Antonyms provided | ○ | ○ | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Manuscript preparation | | | | | | | | | |
| Footnotes and endnotes | | | | | | | | | |
| Includes footnote/endnote capability | ● | ○ | ● | ● | ○ | ○ | ○ | ● | ● |
| Different fonts | ○ | N/A | ● | ● | N/A | N/A | N/A | ● | ● |
| Auto-numbering | ● | N/A | ● | ● | N/A | N/A | N/A | ● | ○ |
| Indexing | | | | | | | | | |
| Includes indexing capability | ● | ○ | ● | ● | ○ | ○ | ● | ○ | ○ |
| Multilevel indexing | ○ | N/A | ○ | ● | N/A | N/A | ○ | N/A | N/A |
| Table of contents | | | | | | | | | |
| Multilevel formats | ● | N/A | ● | ● | N/A | N/A | N/A | ○ | N/A |
| Desktop publishing features | | | | | | | | | |
| Seeking columns | | | | | | | | | |
| Single and seeking columns on same page | ● | ○ | ● | ● | N/A | N/A | N/A | N/A | N/A |
| Maximum no. of columns | Unlimited | 6 | 99 | Unlimited | N/A | N/A | N/A | N/A | N/A |
| Full justification and microjustification | ● | ● | ● | ○ | N/A | N/A | N/A | N/A | N/A |
| Automatics isolation of placement and width | ● | ● | ● | ○ | N/A | N/A | N/A | N/A | N/A |
| Side-by-side columns | | | | | | | | | |
| Maximum no. of columns | Unlimited | N/A | N/A | 10 | N/A | N/A | Unlimited | N/A | N/A |
| Full justification and microjustification | ● | N/A | N/A | ● | N/A | N/A | ○ | N/A | N/A |
| Unmatched column widths available | | | | | | | | | |
| Adjustable gutter width | ○ | ○ | ○ | ● | N/A | N/A | ● | N/A | N/A |
| Single column automatically restored | ● | ● | ● | ● | N/A | N/A | ○ | N/A | N/A |
| Line graphics | | | | | | | | | |
| Erasable line graphics | ○ | ● | ○ | ● | ○ | ○ | ○ | ○ | ○ |
| Dynamic graphics | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Ability to import graphics-format files | ○ | ● | ○ | ● | ○ | ○ | ○ | ○ | ○ |
| Graphics preview | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Page preview | | | | | | | | | |
| | ● | ○ | ○ | ○ | ● | ○ | ● | ○ | ● |

PC MAGAZINE logo — Indicates Editor's Choice ● — Yes ○ — No N/A — Not applicable, program does not have this feature.

| Product name | Volta-writer 3 | Webster's NewWorld Writer I | Word-Perfect | WordStar Professional | WordStar 2000 Plus Upgrade | WPS-PC | Write Now | Write 'n Spell | XyWrite III Plus | ZenWord |
|---|----------------|-----------------------------|--------------|-----------------------|----------------------------|-----------|-----------|----------------|------------------|-----------|
| List price | \$295.00 | \$99.95 | \$495.00 | \$495.00 | \$275.00 | \$150.00 | \$129.00 | \$445.00 | \$39.95 | \$19.95 |
| Price of upgrade | \$95.00 | Free | \$35.00 | \$89.00 | \$69.00 | \$50.00 | N/A | N/A | \$50.00 | |
| Spelling checker, hyphenation, thesaurus | | | | | | | | | | |
| Spelling checker | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| No. of words in standard dictionary | 170,000 | 114,000 | 115,000 | 87,000 | 87,000 | 60,000 | 35,000 | 90,000 | 100,000 | 90,000 |
| Dictionary size | 159K | 146K | 290K | 277K | 300K | 159K | 152K | 233K | 110K | 51K |
| Dictionary developer | In-house | Webster's | In-house | Houghton Mifflin Co. | Houghton Mifflin Co. | In-house | In-house | In-house | Microlytics | In-house |
| No. of user dictionaries | 1 | Unlimited | 1 | Unlimited | Unlimited | Unlimited | Unlimited | Unlimited | Unlimited | Unlimited |
| Spell-checks single word | ● | ○ | ● | ● | ○ | ○ | ○ | ○ | ● | ○ |
| Spell-checks delimited block | ● | ○ | ● | ○ | ○ | ○ | ○ | ○ | ● | ○ |
| Check-as-you-type option | ○ | ○ | ○ | ○ | ○ | ○ | ● | ○ | ● | ○ |
| Specialized spelling checkers | | | | | | | | | | |
| Legal | ○ | ○ | ○ | ● | ● | ○ | ○ | ○ | ○ | ○ |
| Medical | ○ | ○ | ○ | ● | ● | ○ | ○ | ○ | ○ | ○ |
| Other | ○ | ○ | ○ | ● | ● | ○ | ○ | ○ | ○ | ○ |
| Hyphenation | | | | | | | | | | |
| Based on algorithm or dictionary | Both | N/A | Algorithm | Algorithm | Both | N/A | N/A | N/A | Both | N/A |
| Uses hot zone for hyphenation | ● | ○ | ● | ● | ○ | ● | ○ | ○ | ● | ○ |
| Locates soft hyphens | ● | ○ | ● | ● | ● | ○ | ○ | ○ | ● | ○ |
| Allows entering soft hyphens from keyboard | ● | ● | ● | ● | ● | ○ | ○ | ○ | ● | ○ |
| Readjusts to additions and deletions | ● | ● | ○ | ○ | ● | ○ | ○ | ○ | ● | ○ |
| Thesaurus | | | | | | | | | | |
| Antonyms provided | N/A | ○ | ● | ○ | ○ | N/A | N/A | N/A | ○ | N/A |
| Manuscript preparation | | | | | | | | | | |
| Footnotes and endnotes | ○ | ○ | ● | ○ | ● | ○ | ○ | ○ | ● | ○ |
| Includes footnote/endnote capability | N/A | N/A | ○ | N/A | ○ | ○ | N/A | N/A | ● | ○ |
| Different fonts | N/A | N/A | ● | N/A | ● | ○ | N/A | N/A | ● | N/A |
| Auto-numbering | N/A | N/A | ● | N/A | ● | ○ | N/A | N/A | ● | N/A |
| Indexing | | | | | | | | | | |
| Includes indexing capability | ○ | ○ | ● | ● | ● | ○ | ○ | ○ | ● | ○ |
| Multilevel indexing | N/A | N/A | ● | ● | ○ | N/A | N/A | N/A | ● | N/A |
| Table of contents | | | | | | | | | | |
| Multilevel format | ○ | ○ | ● | ● | ○ | ○ | ○ | ○ | ● | ○ |
| Table of contents | N/A | N/A | ● | ● | ● | N/A | N/A | N/A | ● | N/A |
| Desktop publishing features | | | | | | | | | | |
| Seeking column | ○ | ○ | ● | ○ | ● | ○ | ○ | N/A | ● | ○ |
| Singles and seeking columns on same page | N/A | N/A | ● | N/A | ● | N/A | N/A | N/A | ● | N/A |
| Maximum no. of columns | N/A | N/A | 24 | N/A | 3 | N/A | N/A | N/A | 5 | N/A |
| Full justification and microjustification | N/A | N/A | ● | N/A | ● | N/A | N/A | N/A | ○ | N/A |
| Automatic calculation of placement and width | N/A | N/A | ● | N/A | ● | N/A | N/A | N/A | ○ | N/A |
| Side-by-side columns | | | | | | | | | | |
| Maximum no. of columns | N/A | N/A | 24 | N/A | N/A | N/A | N/A | N/A | 10 | N/A |
| Full justification and microjustification | N/A | N/A | ● | N/A | N/A | N/A | N/A | N/A | ● | N/A |
| Unmatched column widths available | N/A | N/A | ● | N/A | ● | N/A | N/A | N/A | ● | N/A |
| Adjustable gutter width | N/A | N/A | ● | N/A | ○ | N/A | N/A | N/A | ● | N/A |
| Single column automatically restored | N/A | N/A | ● | N/A | ● | N/A | N/A | N/A | ● | N/A |
| Line graphics | | | | | | | | | | |
| Eraseable line graphics | ○ | ● | ● | ● | ○ | ○ | ○ | ● | ● | ● |
| Dynamic graphics | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Ability to import graphics-format files | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Graphics preview | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Page preview | | | | | | | | | | |
| Page preview | ○ | ○ | ● | ● | ● | ○ | ○ | ○ | ● | ○ |

(Continued)



Word Processors: Summary of Features

(Products listed in alphabetical order)

| Product name | Allegory | Book Street
Writer Plus | Commmodore
Writer | Cal & Paste | Doc Easy
Word II | DisplayWrite
Assistant | Display-
Write 4 | Easy Extra | Elastic-
Writer |
|--|-----------|----------------------------|----------------------|-------------|---------------------|---------------------------|---------------------|------------|--------------------|
| Last price | \$395.00 | \$79.95 | \$150.00 | \$14.95 | \$49.95 | \$195.00 | \$495.00 | \$99.00 | \$75.00 |
| Price of upgrade | \$29.95 | \$30.00 | \$10.00 | N/A | N/A | N/A | \$75.00 | N/A | N/A |
| Desktop publishing features | | | | | | | | | |
| Full-page vertical monitor supported | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Landscape high-resolution monitor supported | ○ | ○ | ○ | ○ | ○ | ○ | ● | ○ | ○ |
| Zoom image | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Compatible with: | | | | | | | | | |
| Bylines | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| GEM Desktop Publisher | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| The Office Publisher | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| PageMaker | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Ventura Publisher | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Numeric features | | | | | | | | | |
| Main mode | | | | | | | | | |
| Arithmetic | ○ | ● | ○ | ○ | ○ | ○ | ● | ○ | ○ |
| Keyboard calculations | N/A | ● | N/A | N/A | N/A | N/A | ● | N/A | N/A |
| Pop-up calculator | N/A | ● | N/A | N/A | N/A | N/A | ○ | N/A | N/A |
| Reads/imports Lotus 1-2-3 files | ○ | ○ | ○ | ○ | ○ | ○ | ● | ● | ○ |
| Corporate and professional features | | | | | | | | | |
| Mail-merge | ● | ○ | ● | ○ | ● | ○ | ● | ● | Optional |
| Maximum no. of record files | Unlimited | N/A | Unlimited | N/A | Unlimited | N/A | Unlimited | Unlimited | Unlimited |
| Mailing labels printed | ● | N/A | ● | N/A | ● | N/A | ● | ● | ● |
| Group editing and file comparison | | | | | | | | | |
| Revision marking | ○ | ○ | ○ | ○ | ○ | ○ | ● | ○ | ○ |
| Changes verified eye by eye | N/A | N/A | N/A | N/A | N/A | N/A | ○ | N/A | N/A |
| File comparison | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Outline numbering | ○ | ○ | ● | ○ | ○ | ○ | ● | ○ | ○ |
| No. of outline levels supported | N/A | N/A | 7 | N/A | N/A | N/A | 7 | N/A | N/A |
| Collapsible outlines | N/A | N/A | ○ | N/A | N/A | N/A | ○ | N/A | N/A |
| Telecommunications module | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Legal features | | | | | | | | | |
| Creates table of authorities | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Checks citation formats | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Provides line numbering | ○ | ○ | ● | ○ | ○ | ○ | ○ | ○ | ○ |
| Other corporate features | | | | | | | | | |
| Passwords | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| File encryption | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Preformatted forms processing | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Macros | | | | | | | | | |
| Includes macro facility | ● | ● | ● | ○ | ● | ○ | ● | ○ | ● |
| No. of macros | 120 | 40 | 1,225 | N/A | 26 | N/A | 1 | N/A | 9 |
| Can include commands | ● | ● | ● | N/A | ○ | N/A | ○ | N/A | ○ |
| Sort routines | | | | | | | | | |
| Includes sort routines | ● | ○ | ○ | ○ | ○ | ○ | ○ | ● | ○ |
| User can select fields for sorting | ● | N/A | N/A | N/A | N/A | N/A | N/A | ● | N/A |
| Help, documentation, and error handling | | | | | | | | | |
| On-line help available | ● | ● | ● | ○ | ● | ● | ● | ● | ● |
| Context-sensitive on-line help | ● | ● | ● | N/A | ● | ● | ● | ○ | ○ |
| Adjustable help levels | ○ | ○ | ○ | N/A | ○ | ○ | ○ | ○ | ○ |
| Documentation | | | | | | | | | |
| Keyboard templates | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ● |
| Tutorial | ● | ● | ○ | ○ | ● | ● | ● | ● | ● |

●—Yes ○—No N/A—Not applicable; program does not have this feature

| | The
Executive
Footnote | The
Executive
Secretary | Executive
Writer | Final
Draft | Final
Word II | Friendly-
Ware | Galaxy | Harmony | Leading
Edge Word
Processing |
|--|------------------------------|-------------------------------|---------------------|----------------|------------------|-------------------|---------|----------|------------------------------------|
| Product name | \$69.95 | \$159.95 | \$69.95 | \$195.00 | \$395.00 | \$49.95 | \$49.95 | \$149.00 | \$195.00 |
| List price | \$30.00 | \$7.50 | N/A | \$195.00 | \$38.00 | N/A | N/A | Varies | \$100.00 |
| Price of upgrade | | | | | | | | | |
| Desktop publishing features | | | | | | | | | |
| Full-page vertical monitor supported | ○ | ○ | ○ | ○ | ● | ○ | ○ | ○ | ○ |
| Landscape high-resolution monitor supported | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Zoom image | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Compatible with: | | | | | | | | | |
| Bylines | ○ | ○ | ○ | ○ | ● | ○ | ○ | ○ | ○ |
| GEM Desktop Publisher | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| The Office Publisher | ○ | ○ | ○ | ○ | ● | ○ | ○ | ○ | ○ |
| PageMaker | ○ | ○ | ○ | ○ | ● | ○ | ○ | ○ | ○ |
| Ventura Publisher | ○ | ○ | ○ | ○ | ● | ○ | ● | ○ | ○ |
| Numeric features | | | | | | | | | |
| Math mode | | | | | | | | | |
| Arithmetic | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ● |
| Keyboard calculations | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | ● |
| Pop-up calculator | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | ● |
| Reads/imports Lotus 1-2-3 files | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ● |
| Corporate and professional features | | | | | | | | | |
| Mail-merge | Optional | ● | Optional | ● | Optional | ○ | ○ | ○ | ● |
| Maximum no. of record files | Unlimited | Unlimited | 20K | Unlimited | Unlimited | N/A | N/A | N/A | 64,000 |
| Mailing labels printed | ● | ● | ○ | ● | ● | N/A | N/A | N/A | ● |
| Group editing and file comparison | | | | | | | | | |
| Revision marking | ○ | ○ | ○ | ● | ○ | ○ | ○ | ○ | ○ |
| Changes verified one by one | N/A | N/A | N/A | ○ | N/A | N/A | N/A | N/A | N/A |
| File comparison | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Outline numbering | ● | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| No. of outline levels supported | 5 | 5 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Collapsible outlines | ○ | ○ | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Telecommunications module | ● | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Legal features | | | | | | | | | |
| Creates table of authorities | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Checks citation formats | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Provides line numbering | ● | ● | ○ | ● | ○ | ○ | ○ | ○ | ○ |
| Other corporate features | | | | | | | | | |
| Passwords | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ● | ○ |
| File encryption | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Preformatted forms processing | ○ | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Macros | | | | | | | | | |
| Includes macro facility | ● | ● | ● | ● | ● | ○ | ○ | ○ | ● |
| No. of macros | Unlimited | 200 | 10 | 26 | Unlimited | N/A | N/A | N/A | 52 |
| Can include commands | ○ | ○ | ● | ○ | ● | N/A | N/A | N/A | ● |
| Sort routines | | | | | | | | | |
| Includes sort routines | ● | ● | ○ | ○ | ○ | ○ | ○ | ● | ○ |
| User can select fields for sorting | ● | ● | N/A | N/A | N/A | N/A | N/A | ● | N/A |
| Help, documentation, and error handling | | | | | | | | | |
| On-line help available | ● | ● | ● | ● | ○ | ● | ● | ● | ● |
| Context-sensitive on-line help | ● | ● | ○ | ○ | N/A | ● | ● | ● | ● |
| Adjustable help levels | ○ | ○ | ○ | ○ | N/A | ○ | ○ | ○ | ○ |
| Documentation | | | | | | | | | |
| Keyboard templates | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Tutorial | ● | ● | ● | ● | ○ | ○ | ● | ● | ● |

(continues)

MO. Doing business-to-b

MONITORS



MAGNAVOX EGA Multimode 8CM873 \$449

| | |
|-----------------------------|---------|
| Video 310 12" Amber | 129.00 |
| Video 410 12" Amdek | 159.00 |
| Video 432 Amber | 179.00 |
| Color 722 RGB, CGA/EGA | 469.00 |
| Color 732 12" RGB PS/2 | 499.00 |
| Leading Edge | |
| 12" Green TTL | 69.99 |
| Magnavox | |
| 7BM623 12" TTL Amber | 99.99 |
| CM8562 RGB/Composite | 249.00 |
| 9CM053 14" EGA | 379.00 |
| NEC | |
| 1402 Multisync | 599.00 |
| Multisync Plus | 999.00 |
| Packard Bell | |
| 14" Flat Screen TTL | 115.00 |
| 14" Hi-Res EGA | 369.00 |
| Polaroid | |
| Palette EGA Plus | 2399.00 |
| Princeton Graphics | |
| Max 12 12" Amber TTL | 139.00 |
| HX-12 12" Color RGB | 429.00 |
| Ultrasync 12" VGA | 579.00 |
| Taxan | |
| Model 720 14" RGB Color | 299.00 |
| Thompson | |
| 450A 15" Hi-Res 132 col TTL | 169.00 |
| 4120 14" RGB/Comp | 239.00 |
| 4160 14" Hi-Res RGB | 319.00 |
| Zenith | |
| ZMM-149 14" PS/2 Amber | 229.00 |
| ZCM-1490 14" VGA Analog | 749.00 |

DISKETTES

| | |
|---------------------------|-------|
| Maxell | |
| MD2-HDM Hi Density 5 1/4" | 19.49 |
| MFD2-HD Hi Density 3 1/2" | 54.99 |
| MC2050-DC2000 Tape | 18.99 |
| Sony | |
| MD2HD Hi Density 5 1/4" | 18.99 |
| MFD-2DD DS/DD 3 1/2" | 16.99 |

DRIVES

| | |
|----------------------------|---------|
| CMS | |
| Transporter 5 1/4" PS/2 | 269.00 |
| T-160 60MB Tape-Backup | 649.00 |
| Plus 21 Internal 20MB | 319.00 |
| Everex | |
| Stream 60 Teac Tape-Backup | 589.00 |
| Stream 60 PS/2 Backup | Call |
| Imega | |
| 5 1/4" Dual 20MB Bernoulli | 1799.00 |
| Irwin | |
| 110D 10MB Tape Backup | 219.00 |
| 420XT 20MB Tape Backup | 439.00 |



Mountain 20MB Drive Card \$449

| | |
|-----------------------------|---------|
| Mountain | |
| 30MB Drive Card | 499.99 |
| 50MB Drive Card | 699.00 |
| 60MB Tape Backup | 999.00 |
| Dual 5 1/4" BETA Bernoulli | 1899.00 |
| PC-T00 | |
| 40MB Tape Backup | 349.00 |
| Plus Development | |
| 20MB Hard Card | 599.99 |
| Racore | |
| Jr. Expansion Chassis w/DMA | 299.00 |
| Seagate | |
| ST-225 20MB 1/2 Height | 249.00 |
| ST-4051 40MB Full Height | 449.00 |
| Sysgen | |
| Smart Image 60MB Backup | 499.00 |

SOFTWARE

| | |
|------------------------|--------|
| Ansa | |
| Paradox | 449.00 |
| Ashton Tate | |
| D Base III + | 399.00 |
| Borland | |
| Quattro | 139.00 |
| Broderbund | |
| Print Shop | 39.99 |
| Central Point Software | |
| Copy II PC | 24.99 |
| PC Option Board | 84.99 |

SOFTWARE

| | |
|----------------------|-------|
| DAC Software | |
| Easy Accounting | 64.99 |
| 5th Generation | |
| Fastback | 89.99 |
| Funk Software | |
| Sideways | 43.99 |
| Imai | |
| Optimouse w/Dr. Halo | 89.99 |
| Logitech | |
| C7 Mouse w/Software | 79.99 |



WORD PERFECT CORP. Word Perfect 4.2 \$189

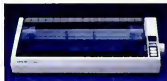
| | |
|-----------------------------------|--------|
| Lotus 1-2-3 | 319.00 |
| Symphony | 439.00 |
| MECA | |
| Managing Your Money | 119.00 |
| Micropro | |
| Wordstar 4.0 Professional w/GL | 229.00 |
| Wordstar 2000 + 2.0 | 289.00 |
| Microim | |
| R: Base System V | 429.00 |
| Micro Soft | |
| Micro Soft Word 4.0 | 239.00 |
| Micro Soft Mouse (Ser/Buss) | 119.00 |
| Microstuf | |
| Crosstalk XVI | 89.99 |
| Migent | |
| Ability | 49.99 |
| Multimate International | |
| Multimate Advantage II (Premium) | 299.00 |
| Norton Software | |
| Advanced Utilities | 86.99 |
| Software Publishing Group | |
| PFS: First Choice (Premium) | 89.99 |
| PFS: Professional Write (Premium) | 129.00 |
| PFS: Professional File (Premium) | 149.00 |
| First Publisher | 69.99 |
| Symantec | |
| Q & A - The Data Base | 229.00 |
| Xerox Corp. | |
| Ventura Publisher 1.1 | 539.00 |

COMPUTER MAIL ORDER

Business, person to person.

PRINTERS

| | |
|------------------------------------|---------|
| Brother | |
| M-1409 180 cps, 80 col. | 319.00 |
| M-1509 180 cps, 132 col. | 389.00 |
| HR-40 40 cps, Daisywriter | 599.00 |
| Fax-100 Facsimile Machine | 1099.00 |
| Citizen | |
| MSP-10 160 cps, 80 col. | 279.00 |
| Premier 35 35 cps Daisywheel | 479.00 |
| C. Itoh | |
| 315 XP Epson/IBM 132 col. | 549.00 |



Epson FX-286E 240 cps, 132 col. **\$439**

| | |
|------------------------------------|---------|
| Epson | |
| LX-800 150 cps, 80 col. | 179.00 |
| FX-86E 240 cps, 80 col. | Call |
| LQ-500 180 cps, 24 Wire | Call |
| LQ-850 330 cps, 80 col. | Call |
| LQ-1050 330 cps, 132 col. | Call |
| Hewlett Packard | |
| ThinkJet | 369.00 |
| NEC | |
| P2200 Pinwriter, 80 col. | 379.00 |
| P660 Pinwriter, 80 col. | 459.00 |
| P760 Pinwriter, 132 col. | 629.00 |
| P580XL Pinwriter, 132 col. | 899.00 |
| Okidata | |
| ML-192 + 200 cps, 80 col. | 319.00 |
| ML-193 + 200 cps, 132 col. | 449.00 |
| ML-292 200 cps, 80 col. | 379.00 |
| Panasonic | |
| KX-1080i 144 cps, 80 col. | 189.00 |
| KX-1091i 194 cps, 80 col. | 199.00 |
| KX-1092i 240 cps, 80 col. | 339.00 |
| KX-1524 240 cps, 24 Wire | 629.00 |
| Sharp | |
| FO-210 Facsimile Machine | 1399.00 |
| Star Micronics | |
| NX-1000 140 cps, 80 col. | 179.00 |
| NX-15 120 cps, 132 col. | 319.00 |
| Toshiba | |
| P321SL 216 cps, 24 Pin Head | 539.00 |
| P351-II 300 cps, 24 Pin Head | 889.00 |

MULTIFUNCTION CARDS

| | |
|------------------------------------|--------|
| AST | |
| Six Pak Plus 576 | 139.00 |
| Advantage AT Board | 289.00 |
| Hot Shot 286 | 369.00 |
| Boca Research | |
| Top Hat 128K expansion | 99.00 |
| Boca EGA | 149.00 |
| Boca RAM/AT 1MB Card | 299.00 |
| DCA | |
| IRMA 2.2 3278 I/O | 799.00 |
| Everex | |
| EV-159 RAM 3000 | 99.99 |
| EV-125 Magic Card AT | 199.00 |
| EV-657 Micro Enhancer Deluxe | 149.00 |
| 5th Generation | |
| Logical Connection 256K | 299.00 |
| Hercules | |
| Color Card | 129.00 |
| In Color Video Adapter | 289.00 |
| Graphics Card | 149.00 |
| Graphics Card Plus | 169.00 |
| IDEAssociates | |
| IDE-5251 Expansion Board | 579.00 |
| Intel | |
| Inboard 386/AT and 386/PC | Call |
| 1110 PC Above Board PS | 279.00 |
| 4020 288 Board w/512K | 329.00 |
| 80287-8 Co-processor | 299.00 |
| NSI | |
| Smart EGA Plus | 229.00 |
| Quadram | |
| XT-386 PG Upgrade | 799.00 |
| Model 30 Quadboard PS/2 | 319.00 |
| Tesg Labs | |
| EVA 480 EGA Adapter | 229.00 |



VIDEO-7 VGA Video Adapter **\$299**

| | |
|-------------------------------|--------|
| Video-7 | |
| VEGA EGA Adapter | 169.00 |
| VEGA EGA Deluxe | 239.00 |
| Zuckerboard | |
| AT Primary Memory Board | 99.99 |
| Tandy DMA Memory | 69.99 |
| Tandy 20MB Hard Card | 499.00 |

MS/DOS SYSTEMS

| | |
|---------------------------------|---------|
| AST | |
| Premium Desktops | Call |
| Compaq | |
| DeskPro 286 | Call |
| DeskPro 386 | Call |
| Compaq Portables | Call |
| IBM | |
| PS/2 Model 30 | Call |
| PS/2 Model 50 | Call |
| Leading Edge | |
| Model D Desktops | Call |
| NEC | |
| PowerMate II 40MB | 2399.00 |
| Multispeed Lap Top | Call |
| PC-T00 | |
| 640K 8 MHz Turbo System | 559.00 |
| 512K 10MHz 1.2MB AT-1800 | 999.00 |
| Toshiba | |
| 1000, 1100, 3120 Lap Tops | Call |
| WYSE | |
| 50, 80 Display Terminals | Call |

MODEMS

| | |
|--------------------------------------|--------|
| Anchor | |
| 1200E External | 129.00 |
| 2400E External | 169.00 |
| Lightening 2400 Baud | 299.00 |
| Best Products | |
| Smart 1 1200, Half Card w/Soft | 99.00 |



HAYES SMARTMODEM 1200 Baud **\$269**

| | |
|---------------------------------|--------|
| Everex | |
| Evercom 920 1200 Baud Int. | 89.00 |
| Evercom 940 2400 Baud Int. | 169.00 |
| Evercom 924 2400 Ext. | 239.00 |
| Hayes | |
| Smartmodem 2400 External | 449.00 |
| Novation | |
| Parrot 1200 w/Software | 99.99 |
| Practical Peripherals | |
| 2400 SA | 199.00 |
| U.S. Robotics | |
| 2400 Baud Internal | 179.00 |

In the U.S.A. and in Canada

Call toll-free: 1-800-233-8950

Outside the U.S.A. call 717-327-9575, Fax 717-327-1217

Educational, Governmental and Corporate Organizations call toll-free 1-800-221-4283
CMO. 477 East Third Street, Dept. B1, Williamsport, PA 17701

ALL MAJOR CREDIT CARDS ACCEPTED

POLICY: Add 3% (minimum \$7.00) shipping and handling. Larger shipments may require additional charges. Personal and company checks require 3 weeks to clear. For faster delivery, use your credit card or send cashier's check or bank money order. Credit cards are not charged until we ship. Pennsylvania residents add 6% sales tax. All prices are U.S.A. prices and are subject to change, and all items are subject to availability. Defective software will be replaced with the same item only. Hardware will be replaced or repaired at our discretion within the terms and limits of the manufacturer's warranty. We cannot guarantee compatibility. All sales are final and returned shipments are subject to a restocking fee.

CIRCLE 183 ON READER SERVICE CARD



Word Processors: Summary of Features

(Products listed in alphabetical order)

| Product name | Lasotype Plus II | MASS-11 Word Processor | Microsoft Windows Write | Microsoft Word | WordReader | MultiMate Advantage II | My Word! | New York Word | Note Boss |
|------------------|------------------|------------------------|-------------------------|----------------|------------|------------------------|-------------------|---------------|-----------|
| List price | \$495.00 | \$395.00 | \$99.00 | \$450.00 | \$49.95 | \$565.00 | \$48.00 | \$45.00 | \$495.00 |
| Price of upgrade | \$100.00 | \$100.00 | N/A | \$75.00 | \$29.95 | \$100.00 | \$4.00 or \$25.00 | \$15.00 | \$50.00 |

Desktop publishing features

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Full-page vertical monitor supported | ○ | ○ | ● | ● | ○ | ○ | ○ | ○ | ● |
| Landscape high-resolution monitor supported | ○ | ○ | ● | ○ | ○ | ○ | ○ | ○ | ○ |
| Zoom Image | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

Compatible with:

| | | | | | | | | | |
|-----------------------|---|---|---|---|---|---|---|---|---|
| Bylines | ○ | ○ | ○ | ○ | ○ | ● | ○ | ○ | ● |
| GEM Desktop Publisher | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ● |
| The Office Publisher | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ● |
| PageMaker | ○ | ● | ● | ● | ○ | ● | ○ | ○ | ● |
| Ventura Publisher | ○ | ● | ● | ● | ○ | ● | ○ | ○ | ● |

Numeric features

| | | | | | | | | | |
|---------------------------------|---|---|---|---|---|---|---|---|---|
| Math mode | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Arithmetic | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Keyboard calculations | ○ | ● | ● | ○ | ○ | ○ | ○ | ○ | ○ |
| Pop-up calculator | ○ | ○ | ● | ○ | ● | ○ | ○ | ○ | ○ |
| Reads/imports Lotus 1-2-3 files | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

Corporate and professional features

| | | | | | | | | | |
|-----------------------------|-----------|-------|-----|-----------|----|-----|-------|-----------|-----------|
| Mail-merge | ● | ● | ○ | ● | ● | ● | ● | ● | ● |
| Maximum no. of record files | Unlimited | 1,000 | N/A | Unlimited | 22 | 254 | 1,000 | Unlimited | Unlimited |
| Mailing labels printed | ● | ● | N/A | ● | ○ | ● | ● | ● | ● |

Group editing and file comparison

| | | | | | | | | | |
|---------------------------------|-----|----|-----|-----|-----|-----|-----|-----|---|
| Revision marking | ○ | ● | ○ | ● | ○ | ○ | ○ | ○ | ● |
| Changes verified one by one | N/A | ○ | N/A | ● | N/A | N/A | N/A | N/A | ● |
| File comparison | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Outline numbering | ○ | ● | ○ | ● | ○ | ○ | ○ | ○ | ● |
| No. of outline levels supported | N/A | 20 | N/A | 128 | N/A | N/A | N/A | N/A | 5 |
| Collapsible outlines | N/A | ○ | N/A | ○ | N/A | N/A | N/A | N/A | ○ |

| | | | | | | | | | |
|---------------------------|---|----------|---|---|---|---|---|---|---|
| Telecommunications module | ● | Optional | ● | ○ | ○ | ○ | ○ | ○ | ○ |
|---------------------------|---|----------|---|---|---|---|---|---|---|

Legal features

| | | | | | | | | | |
|------------------------------|---|---|---|---|---|---|---|---|---|
| Creates table of authorities | ○ | ● | ○ | ● | ○ | ○ | ○ | ○ | ● |
| Checks citation formats | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Provides line numbering | ○ | ● | ○ | ● | ○ | ○ | ○ | ○ | ○ |

Other corporate features

| | | | | | | | | | |
|-------------------------------|---|---|---|---|---|---|---|---|---|
| Passwords | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| File encryption | ○ | ○ | ○ | ○ | ● | ○ | ○ | ○ | ○ |
| Preformatted forms processing | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

Macros

| | | | | | | | | | |
|-------------------------|-----------|----|-----|-----------|----|----|----|-----------|-----------|
| Includes macro facility | ● | ● | ○ | ● | ● | ● | ● | ● | ● |
| No. of macros | Unlimited | 10 | N/A | Unlimited | 10 | 10 | 10 | Unlimited | Unlimited |
| Can include commands | ● | ● | N/A | ● | ● | ● | ● | ● | ● |

Sort routines

| | | | | | | | | | |
|------------------------------------|---|---|-----|---|---|---|---|---|---|
| Includes sort routines | ● | ● | ○ | ● | ○ | ● | ● | ○ | ● |
| User can select fields for sorting | ○ | ○ | N/A | ○ | ○ | ○ | ○ | ○ | ○ |

Help, documentation, and error handling

| | | | | | | | | | |
|--------------------------------|-----|---|-----|---|---|---|---|---|---|
| On-line help available | ○ | ● | ○ | ● | ● | ● | ● | ● | ● |
| Context-sensitive on-line help | N/A | ○ | N/A | ● | ○ | ○ | ○ | ○ | ○ |
| Adjustable help levels | N/A | ○ | N/A | ○ | ○ | ○ | ○ | ○ | ○ |

Onscreen features

| | | | | | | | | | |
|--------------------|---|---|---|---|---|---|---|---|---|
| Keyboard templates | ● | ● | ○ | ● | ○ | ● | ○ | ○ | ● |
| Tutorials | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

■—Indicates Editor's Choice ●—Yes ○—No N/A—Not applicable; program does not have this feature.

| Product name | OfficeWriter | Patent Word Processor | Paperback Writer | PC-Type Plus | PC-Write | Parasol QWERTY | Parasol WordPerfect | PFS: Professional Write | ProctiWord |
|------------------|--------------|-----------------------|------------------|--------------|----------|----------------|---------------------|-------------------------|------------|
| List price | \$495.00 | \$395.00 | \$39.95 | \$69.95 | \$16.00 | \$99.00 | \$195.00 | \$199.00 | \$99.95 |
| Price of upgrade | \$75.00 | \$100.00 | N/A | \$25.00 | \$25.00 | \$15.00 | N/A | N/A | \$15.00 |

Desktop publishing features

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Full-page vertical monitor supported | ● | ● | ○ | ○ | ● | ○ | ○ | ○ | ○ |
| Landscape high-resolution monitor supported | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Zoom image | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Compatible with: | | | | | | | | | |
| Bylines | ○ | ○ | ○ | ● | ○ | ○ | ○ | ○ | ○ |
| GEM Desktop Publisher | ○ | ○ | ○ | ● | ○ | ○ | ○ | ○ | ○ |
| The Office Publisher | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| PageMaker | ● | ○ | ○ | ● | ○ | ○ | ○ | ○ | ○ |
| Ventura Publisher | ● | ○ | ○ | ● | ○ | ○ | ○ | ○ | ○ |

Numeric features

| | | | | | | | | | |
|--------------------------------|---|---|-----|---|-----|-----|-----|-----|-----|
| Math mode | | | | | | | | | |
| Arithmetic | ● | ● | ○ | ● | ○ | ○ | ○ | ○ | ○ |
| Keyboard calculations | ○ | ● | N/A | ● | N/A | N/A | N/A | N/A | N/A |
| Pop-up calculator | ○ | ○ | N/A | ○ | N/A | N/A | N/A | N/A | N/A |
| Read/Imports Lotus 1-2-3 files | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

Corporate and professional features

| | | | | | | | | | |
|-----------------------------------|-----------|-----------|-----|-----------|-----------|-----------|-----|-----|-----------|
| Mail-merge | ● | ● | ○ | ● | ● | ● | ○ | ● | ● |
| Maximum no. of record files | Unlimited | Unlimited | N/A | Unlimited | Unlimited | Unlimited | N/A | 256 | Unlimited |
| Mailing labels printed | ● | ● | N/A | ● | ● | ● | N/A | ● | ○ |
| Group editing and file comparison | | | | | | | | | |
| Revision marking | ○ | ○ | ○ | ○ | ● | ○ | ○ | ○ | ○ |
| Changes verified one by one | N/A | N/A | N/A | N/A | ○ | N/A | N/A | N/A | N/A |
| File comparison | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Outline numbering | ● | ○ | ○ | ○ | ○ | ○ | ● | ○ | ○ |
| No. of outline levels supported | 7 | N/A | N/A | N/A | N/A | N/A | 7 | N/A | N/A |
| Collapsible outlines | ○ | N/A | N/A | N/A | N/A | N/A | ○ | N/A | N/A |
| Telecommunications module | Optional | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Legal features | | | | | | | | | |
| Creates table of authorities | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Checks citation format | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Provides line numbering | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Other corporate features | | | | | | | | | |
| Passwords | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ● | ○ |
| File encryption | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ● | ○ |
| Preformatted forms processing | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

| | | | | | | | | | |
|-------------------------|-----------|----|-----|----|----|----|-----|-----------|-----------|
| Macros | | | | | | | | | |
| Includes macro facility | ● | ● | ○ | ● | ● | ○ | ○ | ● | ● |
| No. of macros | Unlimited | 36 | N/A | 10 | 26 | 26 | N/A | Unlimited | Unlimited |
| Can include commands | ● | ○ | N/A | ● | ● | ○ | N/A | ● | ● |

| | | | | | | | | | |
|------------------------------------|---|---|-----|---|---|---|-----|---|---|
| Sort routines | | | | | | | | | |
| Includes sort routines | ● | ○ | ○ | ● | ○ | ○ | ○ | ○ | ○ |
| User can select fields for sorting | ● | ○ | N/A | ● | ○ | ○ | N/A | ○ | ○ |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Help, documentation, and error handling | | | | | | | | | |
| On-line help available | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Context-sensitive on-line help | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Adjustable help levels | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Documentation | | | | | | | | | |
| Keyboard templates | ● | ● | ○ | ○ | ○ | ○ | ● | ○ | ○ |
| Tutorial | ● | ● | ● | ○ | ● | ● | ● | ● | ● |

(continues)



Word Processors: Summary of Features

(Products listed in alphabetical order)

| Product name | Professional
Writer's
Package | Q&A
Write | R Word
Plus | Sigma
Plus IV | Tutris
Version 4.0
\$29.95
\$29.95
Price includes
2 upgrades | Typist | Voxtek
Word | Varsity
Script | Volkswagen
Deluxe
Plus |
|--|-------------------------------------|--------------|----------------|------------------|---|-----------|----------------|-------------------|------------------------------|
| List price | \$490.00 | \$199.00 | \$495.00 | \$695.00 | \$29.95 | \$45.00 | \$119.99 | \$99.95 | \$99.00 |
| Price of upgrade | \$35.00 | N/A | \$25.00 | \$30.00 | N/A | N/A | \$65.00 | N/A | \$45.00 |
| Desktop publishing features | | | | | | | | | |
| Full-page vertical monitor supported | ○ | ○ | ○ | ● | ○ | ○ | ○ | ○ | ○ |
| Landscape high-resolution monitor supported | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Zoom image | ○ | ○ | ○ | ● | ○ | ○ | ○ | ○ | ○ |
| Compatible with: | | | | | | | | | |
| Bylines | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| GEM Desktop Publisher | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| The Office Publisher | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| PageMaker | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Ventura Publisher | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Numeric features | | | | | | | | | |
| Math mode | | | | | | | | | |
| Arithmetic | ○ | ● | ● | ● | ○ | ○ | ● | ○ | ○ |
| Keyboard calculations | N/A | ○ | ○ | ● | N/A | N/A | ● | N/A | N/A |
| Pop-up calculator | N/A | ○ | ○ | ○ | N/A | N/A | ○ | N/A | N/A |
| Reeds/Imports Lotus 1-2-3 files | ● | ● | ○ | ● | ○ | ○ | ○ | ○ | ○ |
| Corporate and professional features | | | | | | | | | |
| Mail-merge | | | | | | | | | |
| Maximum no. of record files | Unlimited | 1,000 | Unlimited | Unlimited | N/A | Unlimited | Unlimited | Unlimited | Unlimited |
| Mailing labels printed | ● | ● | ● | ● | N/A | ● | ● | ○ | ● |
| Group editing and file comparison | | | | | | | | | |
| Revision marking | ○ | ○ | ○ | ● | ○ | ○ | ○ | ○ | ○ |
| Changes verified one by one | N/A | N/A | N/A | ○ | N/A | N/A | N/A | N/A | N/A |
| File comparison | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Outline numbering | ● | ○ | ○ | ● | ○ | ○ | ○ | ○ | ○ |
| No. of outline levels supported | 5 | N/A | N/A | 6 | N/A | N/A | N/A | N/A | N/A |
| Collapsible outlines | ● | N/A | N/A | ○ | N/A | N/A | N/A | N/A | N/A |
| Telecommunications module | | | | | | | | | |
| Legal features | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Creates table of authorities | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Checks citation formats | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Provides line numbering | ● | ○ | ○ | ● | ○ | ○ | ● | ○ | ○ |
| Other corporate features | | | | | | | | | |
| Passwords | ○ | ○ | ● | ○ | ○ | ○ | ○ | ○ | ○ |
| File encryption | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Preformatted forms processing | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Macros | | | | | | | | | |
| Includes macro facility | ● | ● | ● | ● | ○ | ○ | ● | ● | ○ |
| No. of macros | Unlimited | Unlimited | 999 | 10 | N/A | N/A | 10 | 10 | N/A |
| Can include commands | ● | ● | ● | ● | N/A | N/A | ● | ● | N/A |
| Sort routines | | | | | | | | | |
| Includes sort routines | ○ | ● | ○ | ● | ○ | ○ | ● | ○ | ○ |
| User can select fields for sorting | ○ | ● | ○ | ● | N/A | N/A | ● | N/A | N/A |
| Help, documentation, and error handling | | | | | | | | | |
| On-line help available | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Context-sensitive on-line help | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Adjustable help levels | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Documentation | | | | | | | | | |
| Keyboard templates | ○ | ● | ● | ● | ○ | ○ | ○ | ○ | ○ |
| Tutorial | ● | ● | ● | ● | ○ | ● | ○ | ○ | ● |

PC—Indicates Editor's Choice ●—Yes ○—No N/A—Not applicable; program does not have this feature.

Predict name

| | | | | | | | | | |
|------------------|----------|---------|----------|----------|----------|----------|----------|----------|---------|
| List price | \$295.00 | \$99.95 | \$495.00 | \$495.00 | \$275.00 | \$150.00 | \$129.00 | \$445.00 | \$39.95 |
| Price of upgrade | \$95.00 | Free | \$35.00 | \$89.00 | \$89.00 | \$50.00 | N/A | \$50.00 | \$19.95 |

Desktop publishing features

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Full-page vertical monitor supported | ● | ○ | ● | ● | ○ | ○ | ○ | ● | ○ |
| Landscape high-resolution monitor supported | ● | ○ | ● | ● | ○ | ○ | ○ | ○ | ○ |
| Zoom image | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

Compatible with:

| | | | | | | | | | |
|-----------------------|---|---|---|---|---|---|---|---|---|
| Bylines | ○ | ○ | ● | ● | ○ | ○ | ○ | ○ | ● |
| GEM Desktop Publisher | ○ | ○ | ● | ○ | ○ | ○ | ○ | ○ | ● |
| The Office Publisher | ○ | ○ | ● | ○ | ○ | ○ | ○ | ○ | ● |
| PageMaker | ○ | ○ | ● | ● | ○ | ○ | ○ | ○ | ● |
| Ventura Publisher | ○ | ○ | ● | ● | ○ | ○ | ○ | ● | ● |

Numeric features
Meth mode

| | | | | | | | | | |
|---------------------------------|---|-----|---|---|---|-----|-----|---|-----|
| Arithmetic | ● | ○ | ● | ● | ○ | ○ | ○ | ● | ○ |
| Keyboard calculations | ○ | N/A | ○ | ● | ○ | N/A | N/A | ○ | N/A |
| Pop-up calculator | ○ | N/A | ○ | ● | ○ | N/A | N/A | ○ | N/A |
| Reads imports Lotus 1-2-3 files | ○ | ○ | ○ | ○ | ○ | ○ | ● | ○ | ○ |

Corporate and professional features

| | | | | | | | | | |
|-----------------------------|-----------|-----|-----------|-----------|-----------|--------|-----------|-----------|-----------|
| Mail-merge | ● | ○ | ● | ● | ● | ● | ● | ● | ● |
| Maximum no. of record files | Unlimited | N/A | Unlimited | Unlimited | Unlimited | 65,000 | Unlimited | Unlimited | Unlimited |
| Mailing labels printed | ● | N/A | ● | ● | ● | ● | ● | ● | ● |

Group editing and file comparison

| | | | | | | | | | |
|---------------------------------|-----|-----|-----|-----|-----------|-----|-----|----|-----|
| Revision marking | ○ | ○ | ○ | ● | ○ | ○ | ○ | ● | ○ |
| Changes verified one by one | N/A | N/A | N/A | ○ | ○ | N/A | N/A | ○ | N/A |
| File comparison | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Outline numbering | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| No. of outline levels supported | N/A | N/A | 7 | N/A | Unlimited | N/A | N/A | 15 | N/A |
| Collapsible outlines | N/A | N/A | ○ | N/A | ● | N/A | N/A | ○ | N/A |

Telecommunications module

| | | | | | | | | | |
|------------------------------|---|---|---|---|---|---|---|---|---|
| Legal features | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Creates table of authorities | ○ | ○ | ● | ○ | ○ | ○ | ○ | ○ | ○ |
| Checks citation formats | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Provides line numbering | ○ | ○ | ● | ○ | ○ | ○ | ○ | ○ | ○ |

Other corporate features

| | | | | | | | | | |
|-------------------------------|---|---|---|---|---|---|---|---|---|
| Passwords | ○ | ○ | ● | ○ | ○ | ○ | ○ | ○ | ○ |
| File encryption | ○ | ○ | ● | ○ | ○ | ○ | ○ | ○ | ○ |
| Preformatted forms processing | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

Macros

| | | | | | | | | | |
|-------------------------|-----|-----|-----------|---|----|-----|-----|----|----|
| Includes macro facility | ○ | ○ | ● | ● | ● | ○ | ○ | ● | ● |
| No. of macros | N/A | N/A | Unlimited | ● | 40 | 100 | N/A | 36 | 10 |
| Can include commands | N/A | N/A | ● | ● | ● | ● | N/A | ● | ● |

Sort routines

| | | | | | | | | | |
|------------------------------------|---|-----|---|-----|---|---|-----|---|-----|
| Includes sort routines | ● | ○ | ● | ○ | ● | ○ | ○ | ● | ○ |
| User can select fields for sorting | ● | N/A | ● | N/A | ○ | ○ | N/A | ○ | N/A |

Help, documentation, and error handling

| | | | | | | | | | |
|--------------------------------|---|---|---|---|---|---|---|---|---|
| On-line help available | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Context-sensitive on-line help | ○ | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Adjustable help levels | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

Documentation

| | | | | | | | | | |
|--------------------|---|---|---|---|---|---|---|---|---|
| Keyboard templates | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Tutorial | ● | ● | ● | ● | ● | ● | ● | ● | ● |

(continues)



Word Processors: Summary of Features

(Products listed in alphabetical order)

| Help, documentation, and error handling | Allegory | Bank Street Writer Plus | Command-Writer | Cel & Poste | Doc Easy Word II | Display/Write Assistant | Display-Write 4 | Easy Extra | Einstein-Writer |
|--|----------------|-------------------------|----------------|-------------|------------------|-------------------------|-----------------|------------|-----------------|
| Installation | | | | | | | | | |
| Automated installation | ● | ○ | ● | ○ | ● | ● | ○ | ● | ● |
| Hardware environment recognized automatically | ● | ○ | ● | ○ | ○ | ● | ○ | ● | ● |
| Error messages | | | | | | | | | |
| Explains error | ● | ● | ● | ● | ○ | ○ | ○ | ● | ● |
| Suggests remedy | ○ | ○ | ● | ○ | ○ | ○ | ○ | ● | ● |
| Alerts user when abandoning, aborting, or quitting an altered file | ● | ● | ● | ○ | ● | ● | ○ | ● | ● |
| Tech support | | | | | | | | | |
| Free support | 1 year | Unlimited | Unlimited | Unlimited | 1 month | N/A* | N/A* | Unlimited | Unlimited |
| Cost of single-user paid support | \$75/year | N/A | Free | Free | \$60/year | N/A* | N/A* | N/A | Free |
| Cost of multiple-user paid support | \$50/user/year | N/A | N/A | Free | N/A | N/A* | N/A* | N/A | Free |

| Help, documentation, and error handling | Lexitype Plus II | MASS-11 Word Processor | Microsoft Windows Write | Microsoft Word | MindReader | MelliMate Advantage II | My Word! | New York Word | Note Bene |
|--|------------------|------------------------|-------------------------|----------------|--------------|------------------------|-----------|---------------|-----------|
| Installation | | | | | | | | | |
| Automated installation | ● | ○ | ● | ● | ○ | ○ | ○ | ● | ● |
| Hardware environment recognized automatically | ● | ○ | ● | ● | ● | ○ | ○ | ○ | ○ |
| Error messages | | | | | | | | | |
| Explains error | ● | ● | ● | ○ | ○ | ● | ● | ● | ● |
| Suggests remedy | ○ | ○ | ○ | ○ | ○ | ● | ● | ○ | ○ |
| Alerts user when abandoning, aborting, or quitting an altered file | ● | ● | ● | ● | ● | ● | ● | ● | ○ |
| Tech support | | | | | | | | | |
| Free support | Unlimited | None | Unlimited | Unlimited | 1 year | 3 months | Unlimited | Unlimited | Unlimited |
| Cost of single-user paid support | None | \$50/year | Free | N/A | \$29.95/year | \$150/year | Free | Free | N/A |
| Cost of multiple-user paid support | None | Contract basis | Free | N/A | N/A | \$100/year | Free | Free | N/A |

| Help, documentation, and error handling | Professional Writer's Package | QAA Write | R Word Plus | Samsa Plus IV | Textro | Typist | Vantex Word | Versity Script | Volkswriter Deluxe Plus |
|--|-------------------------------|-----------|-------------|---------------|-----------|-----------|-------------|----------------|-------------------------|
| Installation | | | | | | | | | |
| Automated installation | ○ | ● | ○ | ○ | ○ | ○ | ● | ○ | ● |
| Hardware environment recognized automatically | ○ | ● | ○ | ○ | ○ | ○ | ○ | ○ | ● |
| Error messages | | | | | | | | | |
| Explains error | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Suggests remedy | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Alerts user when abandoning, aborting, or quitting an altered file | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Tech support | | | | | | | | | |
| Free support | Unlimited | Unlimited | 1 month | 1 month | Unlimited | Unlimited | Unlimited | N/A | Unlimited |
| Cost of single-user paid support | Free | N/A | \$250/year | \$125/year | N/A | Free | N/A | \$25/year | N/A |
| Cost of multiple-user paid support | Free | N/A | \$250/year | \$199/year | N/A | Free | N/A | N/A | N/A |

— Indicates Editor's Choice ●—Yes ○—No N/A—Not applicable; program does not have this feature.

| Help, documentation, and error handling | The Executive Footnoter | The Executive Secretary | Executive Writer | Final Draft | Final Word II | Friendly-Word | Galaxy | Harmony | Leading Edge Word Processing |
|--|-------------------------|-------------------------|------------------|---|---------------|---------------|-----------|---------------------------|------------------------------|
| Installation | | | | | | | | | |
| Automated installation | ● | ● | ○ | ● | ○ | ● | ● | ● | ● |
| Hardware environment recognized automatically | ● | ● | ○ | ○ | ○ | ○ | ● | ● | ○ |
| Error messages | | | | | | | | | |
| Explains error | ○ | ○ | ● | ● | ○ | ● | ● | ● | ● |
| Suggests remedy | ○ | ○ | ○ | ○ | ○ | ● | ○ | ● | ● |
| Alerts user when abandoning, aborting, or quitting an altered file | ○ | ● | ● | ● | ● | ● | ● | ● | ○ |
| Tech support | | | | | | | | | |
| Free support | 1 year | 1 year | None | None | Unlimited | Unlimited | Unlimited | None | Unlimited |
| Cost of single-user paid support | \$30/year | \$30/year | \$5/minute | None \$120/minute, Free \$10 minimum per call | Free | None | Free | \$3.95/call, \$20 minimum | None |
| Cost of multiple-user paid support | N/A | N/A | N/A | N/A | None | None | None | Same as above | None |

| Help, documentation, and error handling | OfficeWriter | Palenir Word Processor | Paperback Writer | PC-Type Plus | PC-Write | Personal QWERTY | Personal WordPerfect | PFS: Professional Write | PractiWord |
|--|--------------|------------------------|------------------|--------------|-----------|-----------------|----------------------|-------------------------|------------|
| Installation | | | | | | | | | |
| Automated installation | ● | ● | ○ | ● | ● | ● | ○ | ○ | ○ |
| Hardware environment recognized automatically | ● | ○ | ○ | ○ | ○ | ● | ○ | ● | ○ |
| Error messages | | | | | | | | | |
| Explains error | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Suggests remedy | ● | ○ | ○ | ○ | ○ | ● | ○ | ○ | ● |
| Alerts user when abandoning, aborting, or quitting an altered file | ● | ● | ● | ● | ● | ● | ○ | ● | ● |
| Tech support | | | | | | | | | |
| Free support | Unlimited | 2 months | N/A | 1 year | N/A | Unlimited | Unlimited | Unlimited | 2 months |
| Cost of single-user paid support | Free | \$50/year | \$5/minute | Free | \$35/year | N/A | Free | N/A | \$50/year |
| Cost of multiple-user paid support | Free | N/A | N/A | N/A | N/A | N/A | Free | Variable | N/A |

| Help, documentation, and error handling | Verba-writer 3 | Webster's NewWorld Writer I | PC Word-Perfect | WordStar Professional | WordStar 2000 Plus Upgrade | WPS-PC | Write Now | Write 'n Spell | PC XyWrite III Plus | ZenWord |
|--|----------------|-----------------------------|-----------------|-------------------------------|-------------------------------|-----------|-----------|----------------|---------------------|-----------|
| Installation | | | | | | | | | | |
| Automated installation | ● | ○ | ○ | ● | ● | ● | ○ | ○ | ● | ● |
| Hardware environment recognized automatically | ○ | ○ | ● | ○ | ○ | ● | ○ | ○ | ○ | ● |
| Error messages | | | | | | | | | | |
| Explains error | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Suggests remedy | ● | ● | ● | ● | ○ | ● | ○ | ○ | ● | ○ |
| Alerts user when Abandoning, aborting, or quitting an altered file | ● | ● | ● | ● | ● | ● | ○ | ○ | ○ | ● |
| Tech support | | | | | | | | | | |
| Free support | Unlimited | Unlimited | Unlimited | Life of release plus 6 months | Life of release plus 6 months | Unlimited | Unlimited | Unlimited | Unlimited | Unlimited |
| Cost of single-user paid support | N/A | N/A | N/A | Free | Free | N/A | Free | Unlimited | N/A | N/A |
| Cost of multiple-user paid support | N/A | N/A | N/A | Free | Free | N/A | Free | Unlimited | N/A | N/A |

(ends)

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- ONE YEAR WARRANTY

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60MB (23ms) \$3295

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- INTEL 80286 CPU
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- LANDMARK 10MHz
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- ONE 1.2MB FLOPPY DRIVE
- ENHANCED KEYBOARD
- OPERATIONS MANUAL
- ONE YEAR WARRANTY

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60MB (23ms) \$1995

OPTION: 12MHz, ADD \$200

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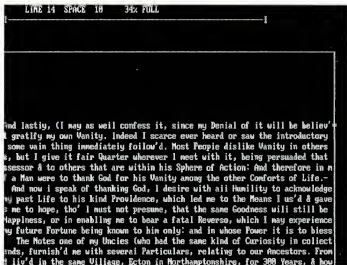


Lexitype Plus II is the PC version of the *Lexitron* dedicated word-processing system. Unlike other dedicated WP clones such as *MultiMate* and *OfficeWriter*, however, this \$495 dedicated program does not take advantage of current PC software technology.

The manual states that *Lexitype* should be very easy for beginners because it closely emulates typing on a typewriter. Indeed, there are many parallels between the two.

Lexitype has no automatic repagination, and thus no need for widow or orphan control or nonbreaking blocks of text. When you press the Spacebar on a typewriter, the carriage advances a single space; in *Lexitype*, the Spacebar advances the cursor a single space but does not overtype or insert characters.

On a typewriter, you can set a bell to



Since the only way to bring text files into *Lexitype Plus II* is through its import function, you would expect the software to do a good job of it. Instead, each paragraph must be adjusted manually to fit within the document margins.

ring as you approach the right margin. Similarly, a bell—which you cannot disable—also sounds in *Lexitype*. Like a typewriter, *Lexitype's* default typing mode has no word wrap. Word wrap, called "continuous type" in *Lexitype*, exists but must be turned on each session by pressing Ctrl-F5. Word wrap will work, however, only in insert mode. In overtype mode, you will just run into the right margin.

Although the manual states that with *Lexitype*, "what you see is what you get," in fact it is just the opposite. *Lexitype's* document display can show only single underlining on-screen. Boldface, italic, and other special formats are obtained by inserting codes before and after the desired block of text. Double underlines must be placed on a separate typing line below the text, and this complete line will not print.

Because the codes may not be hidden, it is very difficult to get an accurate picture of how the printed document will look. For users who have graphics capability, a page preview mode is available; this displays italic and overstrike characters as well as paragraph justification in a miniature but readable format. The print codes are still

displayed to preclude viewing a properly formatted page.

EASY INSTALLATION Installing the system on a hard disk is as simple as typing A:install, which executes a batch file to copy the software—including a most important file called the master index—into a "Lex" directory.

In Lex, each document is not stored as an individual DOS file. Instead, documents are stored as entries in one large master index. There can be only one index per drive letter, with each index containing 56 subindexes that may hold up to 56 documents. The maximum size of all documents in any subindex is 360K.

Using the DOS SUBST command, multiple master indexes may be created on a single hard disk. The advantage of this file structure is that a new user need not know DOS to start saving and retrieving files. The disadvantage is that manipulating a document, including copying and merging, requires several keystrokes from within the master index when the document's contents are not displayed on-screen.



FACT FILE



Lexitype Plus II
Lexitronics Inc., #14
Sterling, VA 22170
(703) 450-5000
List Price: Single-user
version, \$495; network
version, \$695 plus \$195

per workstation.

Requires: 512K RAM, two disk drives or one disk drive and hard disk (hard disk recommended). DOS 2.0 or later.

In Short: A PC version of the *Lexitron* dedicated word processor. Emulates a typewriter and doesn't take advantage of PC technology. There are better buys at this price. Not copy protected.

CIRCLE 604 ON READER SERVICE CARD

In the network version of *Lextype*, users may access the same master index, but each subindex must be nonshareable, although other users may view the documents stored in the subindex.

All is not lost to the DOS world, however. An import/export routine transfers documents to and from DOS, but only with carriage returns at the end of each line. Lex also allows DCA and .DIF conversion routines, as well as direct translation to *WordPerfect*.

The *Lextype* page display is very clean, with only a ruler line and an information line displaying the line and the character of the current cursor position. The ruler line displays left and right margins and tab stops to indicate left or decimal tabs; center- and right-aligned tabs are not available. The page number is displayed only when pressing the Doc Info (gray Plus) key. Since *Lextype* does not deal with filenames, no name is available for display, and the document title may not be displayed.

The system will do microspace justification of an entire document but not just of a desired block of text. Although there is no automatic hyphenation capability, the system will stop at the end of each line to allow you to hyphenate as desired. To continue editing the document, you must turn off justification.

If you forget to do this, all new text added to the document will not be stored upon exit, but there is almost no warning of this except for a cryptic "Document Archived" message.

A primitive undo feature allows only for canceling all revisions since the document was last saved. No partial undo is available. Undo cannot undelete a deleted page, and no warnings of this potential danger are issued when deleting the page.

In addition, function key placement and layout are completely nonstandard. Cancel and undo are located on the ScrollLock key. Esc is used solely to exit *Lextype* after closing the master index. PgUp and PgDn move the cursor from the beginning to the end of a line, and the End key erases a single character. The grouping of functions on the function keys seems totally random as well. The justify, tab clear, and copy functions, for example, are all located on F7.

Lextype is targeted at large companies and government agencies that formerly used the *Lextron* dedicated WP equipment. If you're moving from *Lextron* to PCs, it may be useful, but you get more features at half the price with such systems as *PFS:Professional Write* and *Q&A Write*.—Morris W. Stemp

MASS-11 Word Processor

SUITABILITY TO TASK

Professional

Corporate

Personal

Legal

Desktop Publishing



Microsystems Engineering Corp.'s \$395 word processor is just one of a family of products in the *MASS-11* line. Although fully functional as a standalone product, *MASS-11 Word Processor* can also be integrated into a complete package including database management, communications, and graphics.

The *MASS-11* name is an acronym for "Microsystems Administrative Support System," with the "11" being a holdover from its original implementation on the DEC PDP/11 series of minicomputers. It remains a leading choice for scientific word-processing applications on the VAX/VMS family of minicomputers today, in large part because of its vast array of features—scientific-character support, built-in five-function calculator, spelling checker, list processing, user-definable keys (macros), graphics image integration, index (as well as table-of-contents and table-of-authority) generators, support for PostScript-compatible laser printers, and a great deal more.

EMULATING DEC *MASS-11* is a delight for those already familiar with DEC word processing systems because it gives you a choice of editors: one for editing on

the PC that includes a good use of function keys, and one that provides full emulation of the WPS-style editor used on DECmate word processors and on DEC minicomputer installations running *DECWORD* through VT-131 terminals. There is also an emulation of the VAX/EDT editor for those who are unwilling to give up this dying entity.

To make the most of those editors, *MASS-11* comes packaged with a sheet of keycap labels. Less convenient than a template (which can be moved from one computer to another), the labels suffer from low-contrast (yellow and blue) printing, along with characters much too small to be read comfortably from a normal, seated position. They're more of an annoyance than a problem, really.

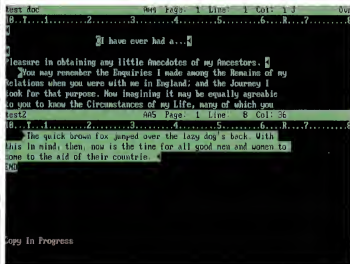
However, you can ignore the labels altogether because the editor is logically arranged. Most commands are initiated by pressing F1 followed by a single mnemonic keystroke, such as "C" for copy, "P" for paste, and the like (not to mention a few others like "K" for "Kut"). If you have initiated a command and then found that it's not what you really intended to do, the F4 key cancels it and returns you to the editor with no harm.

To protect you from frustrating little accidents, Version 7A includes a rotary (last-in, first-out) buffer for deleted text. It holds up to the last 500 lines of deleted text, and each press of the F1-U key-stroke sequence restores the deletions (the most recent first) to the point where the cursor is resting on the screen.

WINDOWING A limited form of windowing is available within the editor by way of split-screen operation. Two text files can be edited simultaneously, each in its own separate 12-line text window (nine lines of which are actually text). A single keystroke toggles between windows, and a piece of text can be copied from one window, entered into a temporary buffer, and pasted into the other.

The spelling checker has a 100,000-word dictionary and will open up a window on the screen with its ten "best guesses" when an unknown word is encountered. Words foreign to it can also be placed in a private dictionary. Although no thesaurus is included, *Webster's New*

■ WORD PROCESSORS



MASS-11 Word Processor is shown here operating in split-screen mode, each window containing a different document. In this example, text within the second window has been marked to be copied to the first.

World On-Line Thesaurus worked perfectly when installed for WordStar.

Although MASS-11 might not qualify as a true WYSIWYG word processor in

this era of desktop publishing programs and million-plus pixel monitors, its performance is nevertheless commendable on a standard EGA monitor. Regular, italic, and boldfaced text is displayed on the screen as it would appear on a printed page, but only one type size is shown. Centered text, similarly, is accurately displayed in its correct position, as is text justified left and right.

SCIENTIFIC USE More important to those with scientific word-processing needs is the accurate display of technical characters, such as Greek letters and simple line drawings. So, too, are multicolored documents displayed in their final form. Page widths of up to 250 columns are possible and can be viewed by scrolling the display horizontally as well as by scrolling vertically.

Of equal importance to those with scientific (and legal) requirements for their word processor will be MASS-11's ability to automatically generate an index and tables of contents and authority. The text for each can be marked within the document and will appear in the tables in correct con-

text even after reformatting.

Another feature attractive to the legal market is the combination of red-lining (where text can be removed from active processing but still displayed on the screen) along with nonprinting comments.

An internal five-function calculator is part of the package and may suffice in many situations where an external spreadsheet file would otherwise have to be imported from some other packages. The calculator can also function in command mode for quick summations.

GRAPHICS Graphics integration capabilities have not been overlooked, and a number of standard graphics file structures can be incorporated directly. These include Lotus 1-2-3 .PIC files, Chart-Master graphics (or any others conforming to the Hewlett-Packard Graphics Language standard), and images created with MEC's own MASS-11 Draw package. While not displayed on the screen during editing, they will appear on the final printed page.

Macros are an integral part of MASS-11, but MEC's parlance for them ("user-definable keys") is in keeping with its DEC heritage. Each macro is initiated with the F1 key followed by a single numeric key, the limits being a maximum of 200 characters per macro up to a maximum of 1,600 characters. In addition, macros can be merged with keyboard input, circumventing these limits to a large extent.

MEC claims that MASS-11 will operate on more than 500 printers, although not all features will be available on every one. Support for PostScript-compatible laser printers (such as the Apple LaserWriter) is included with the basic package. Additional drivers are available for laser printers from DEC, Hewlett-Packard, QMS, Talaris Systems, and Xerox for \$100 each.

DOCUMENTATION The outstanding manual that is supplied with MASS-11 makes installation and operation a breeze, provided you are open-minded about its organization; all of the commands and features are presented in alphabetical order, and the index refers you to the appropriate topic by name rather than by page number. Another, smaller manual details the installation process from the 12 floppy disks to your hard disk and contains a three-part tu-



FACT FILE



(312) 882-0111
List Price: \$395
Requires: 384K RAM, two disk drives,
DOS 3.1 or later.

MASS-11 Word Processor, Version 7A
Microsystems
Engineering Corp.
2400 W. Havestell Rd.,
#300
Hoffman Estates, IL
60195

In Short: A powerful word processor, well suited to scientific uses, that works equally well in legal and corporate environments. Can be integrated into a complete office automation system. Total compatibility with the VAX version makes it a winner for networked DEC-mini/MIS-DOS-micro settings. Not copy protected.

CIRCLE 679 ON READER SERVICE CARD

tutorial to help you get started.

Comparing *MASS-11*'s performance on a VAX (an 8550, in this case) and a PC AT, we thought the PC version proved superior under most circumstances. With no other users on the VAX (an unlikely scenario), the VAX appeared to perform tasks such as a global search-and-replace in about a quarter of the time required on the AT. Under more-typical circumstances, with 30 users on the VAX, the AT was clearly the winner.

MASS-11 will no doubt appeal to those already running the same package on a VAX, but its substantial features make it a prime candidate for many word processing chores.—Frank Bican

Microsoft Windows Write

SUITABILITY TO TASK

Professional



Corporate



Personal



Legal



Desktop Publishing

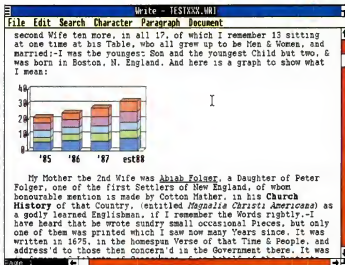


1 2 3 4

When Microsoft released *Microsoft Excel* for the PC, many industry pundits dubbed it the first truly useful *Windows* application, but lurking behind the scenes, disguised as a giveaway utility that comes bundled with the \$99 *Windows*, *Microsoft Windows Write* has been helping people get real work done for quite a while.

In line with its class (a utility) and price (free), you won't find the level of control necessary for heavy letter-crunching. If you are looking for features like the macros of *XyWrite* or the style sheets of *Microsoft Word*, you will not find them here.

EASE OF USE DEFINED When you start the program, you are presented with a large blank area with the cursor placed in the first space. A row of pull-down menus located across the top, accessible by either a mouse or an Alt-key combination, takes



Any graphic captured in *Windows* can be easily imported into a document in *Microsoft Windows Write*. This provides limited desktop publishing abilities. While you cannot put text next to or around a graphic, this ability is still very useful.

care of all of the features.

The use of optional key commands allows you to remember the shortcuts for frequently used commands, but still be able to execute less-frequently used features with very little effort. A little exploration of the logically named menus and options will reveal the one that you are looking for; this approach, borrowed from the Macintosh design, is the best for handling environments that have many possible actions.

The mnemonic key combinations are reasonably well coded, though the limited number of options helps. In *Excel*, for example, the same approach can become overstretched, leading to cases such as Alt-R-T for the formula-paste function.

Typing appears immediately in the default font, single-spaced with word wrap at default margins. Default typeface and size are determined by the printer installed.

To make modifications to the text, such as changing fonts, all you do is highlight the text to be modified (again, with either the mouse or keyboard) and pull down the appropriate menu or enter the combination to select the new attribute, font, or format.

A ruler can be optionally turned on, al-

lowing both a visual confirmation of the current settings and the ability to change such things as margins and tabs by dragging them with a mouse.

Searching is limited to simple string

FACT FILE



Microsoft Windows Write, Version 4.0
Microsoft Corp.
16011 NE 36th Way
Box 97017
Redmond, WA 98073-9717
(206) 882-8088

List Price: Bundled with *Microsoft Windows*, \$99.

Requires: 320K RAM (512K recommended), two disk drives (hard disk recommended), graphics adapter card (EGA needed for color), DOS 2.0 or later.

In Short: Free if you have *Windows*; and even if you don't, *Write* alone could justify the purchase. It's also easy to use. Not copy protected.

CIRCLE 66 ON READER SERVICE CARD

■ WORD PROCESSORS

searches, with options for case sensitivity and whole-word matching. There is also a function-key option to select Find Next. The search-and-replace function adds the ability to change all matches without checking.

One nice feature of many search-and-replace options—the ability to manipulate formatting characters—is not available in *Windows Write*. Text can be cut directly from the document, or anywhere else you like in *Windows*, and pasted into either the Find, Search, or Replace string.

A selection from the file menu allows you to change printers, among those that have been installed with *Windows*, on the fly. This includes the ability to change HP font cartridges and the printer memory installed. It also allows you to change paper size, page orientation (portrait or landscape), and the paper tray used. In addition, the standard *Windows* print buffer allows you to return to your editing once the print command has been sent.

Headers and footers can be added easily with a menu selection. Text can be cut from the main document and pasted into the header or footer area, easily turning a document title into a header, after the fact. Printing of headers and footers on the first page can be turned off. Distance from page top or bottom in inches, not lines, can be altered here, rather than in the page layout area. And the page number can be inserted automatically into your string.

The requirement that *Write* run under *Windows*, its greatest asset, may rule it out for some people. But even those who believe that they have no need for *Windows* should take a look at *Write* as if it were a standalone package.

Wanting to use *Windows* to run several applications does not mean you must use it as your operating environment; and if you choose *Write* by its own merits, what's the harm in picking up *Windows* for free? This *Windows* link also provides for future enhancements in the operating environment, along with the list of supported products with each upgrade of *Windows*.

When Microsoft finally releases a version of *Word* that runs under its own *Windows* environment, many of the features and ease-of-use factors available by running under *Windows* will be available with *Word* as well. The cost of *Word*, however,


will still limit the areas for which it would be considered.

LOW-END DESKTOP PUBLISHING

Exploiting the *Windows* environment, *Write* offers you access to a wide range of printers, video, and pointing devices. Add to that true WYSIWYG screen display and the ability to import graphics into documents, and you have what might best be described as a low-end desktop publishing package.

You will find support for the Microsoft Z cartridge, PostScript printers, mice, and much more. You will see a reasonable facsimile of the fonts and attributes (like bold, underline, and italic) on-screen. Full-screen mouse or keyboard editing, cutting and pasting with automatic reformatting are all a breeze. You have complete control over margins, alignment, and tabs, seeing all format changes immediately on-screen.

It's as if the designers looked at desktop publishing, took from it what would be useful in day-to-day single-page word processing, and added those elements to a good low-end word processor. The result is a highly livable and powerful package for daily use.—Philip F. H. Rose



Microsoft Word

SUITABILITY TO TASK

| | | | | |
|--------------------|---|---|---|---|
| Professional | ● | ● | ● | ● |
| Corporate | ● | ● | ● | ● |
| Personal | ● | ● | ● | ● |
| Legal | ● | ● | ● | ● |
| Desktop Publishing | ● | ● | ● | ● |
| | 1 | 2 | 3 | 4 |

Microsoft Word, introduced in 1984, was one of the few word processing programs with a WYSIWYG screen display. Its graphics mode put things on our screens that we'd grown used to living without—italic, bold, and underlines that looked like italic, bold, and underlines. There was no highlight here. What we saw was what we got on the printout.

But the graphics mode slowed the program's performance. Now in Version 4.0, *Microsoft Word* has gained speed. *Word* now lets you toggle between the graphics and text mode and even adjust cursor speed in the text mode on a scale from 1 through 9. The default is 3—and that's fast on a 10-MHz AT—but if warp drive is what you want, you can achieve it by moving the speed setting to 9.

Microsoft Word was an Editor's Choice in *PC Magazine's* word processing block-buster 2 years ago. Today it is every bit the powerhouse it was then. Its laundry list of features includes footnotes and endnotes, index and table-of-contents generation, line drawing, four-function math, and more. Yet with all that, its menus still let the novice get started quickly.

Priced at \$450, Version 4.0 has added macros, the ability to read spreadsheet files, the ability to surround text with a box, and document retrieval features for finding files by title, author, keywords, or full text search.

MARVELOUS MACROS Much of *Microsoft Word* 4.0's appeal is its increased flexibility. *Word* always let you bypass its menus with speed-key combinations, but *Word* 4.0 offers even more speed-key choices. What's more, you now get macros that will help you tailor the program to your writing style. You can assign macros to an arbitrary combination of letters, a Ctrl-key combination, or a function key that can be shifted, unshifted, or used in combination with the Alt or Ctrl key.

You can also redefine the function-key commands and create mnemonic Ctrl-key commands. *Microsoft Word's* macro feature is unusual in that, like *WordStar*, it allows you to define a two-keystroke command. For example, Ctrl-Q-F could duplicate the *WordStar* mnemonic Quick Find.

The easiest way to create *Word* macros is in learn mode. Turn it on, and the macro memorizes menu commands, function-key commands, cursor-key commands, boilerplate text, or any key combinations that you type. You can also edit macros and add commands from *Word's* macro language to ask for information from the keyboard, display messages, and use any conditional statements of your choice to

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|-----------|---------------------|---------------------|--------------------|
| HP | | | |
| Bitstream | | | |
| Font | YES | NO | |
| Font | YES | NO | YES |
| Font | YES | NO | 14 |
| Font | 2 | 2 | YES |
| Font | NO | NO | YES |
| Font | YES | YES | :16 |
| Font | 1:34 | — | \$99 ⁹⁵ |
| Price | \$195 ⁰⁰ | \$200 ⁰⁰ | |

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CIRCLE 299 ON READER SERVICE CARD

■ WORD PROCESSORS

11.....2.....3.....4.....5.....6.....7.....

BP I have ever had a Pleasure in obtaining any little
 Anecdotes of my Ancestors. You may remember the Enquiries I
 made among the Kinsmen of my Relations when you were with me
 in England; and the Journey I took for that purpose. ¶

BP Now IMAGINE IT MAY BE EQUALLY PLEASANT TO
 YOU TO KNOW THE CIRCUMSTANCES OF MY LIFE, MANY OF
 WHICH YOU ARE YET UNACQUAINTED WITH; AND EXPECTING
 A WEEKS UNINTERRUPTED LEISURE IN MY PRESENT
 COUNTRY RETIREMENT, I SIT DOWN TO WRITE THEM FOR
 YOU. ¶

BP —To which I have besides some other Inducements, Having
 emerg'd from the Poverty & Obscurity in which I was born &
 bred, to a State of Affluence & some Degree of Reputation in
 the World; and having gone so far thro' Life with a
 considerable Share of Felicity, the concluding Means I made
 use of, which, with the Blessing of God, so well succeeded,
 my Posterity may like to know, as they may find some of them
 suitable to their own Situations, & therefore fit to be
 related. ¶

BP —That Felicity, when I reflected on it, has induc'd me sometimes to say
 were it offer'd to my Choice, I should have no Objection to a Repetition of
 Life from its Beginning, only asking the Advantage Authors have in a second
 Edition to correct some Faults of the first. So would I if I might, besides
 ¶1 LIB C028 {} ? GENERIC.TXT

As demonstrated here, Microsoft Word's graphics mode can show boldface, underlining, double underlining, italic, strikethrough, and other enhancements on-screen.

control macro execution.

In Version 4.0, Microsoft made some small but noteworthy changes in command logic. In previous versions, you used an arcane combination of the Tab key and Spacebar to navigate Word's menus. In 4.0, you use arrow keys, a more comfortable way of doing things.

Microsoft Word 4.0, by using function keys in combination with Alt and Ctrl, puts twice as many commands at your fingertips as the earlier versions did. Word 3.11 used only shifted and unshifted function keys.

The new version also includes some small customizations that are very welcome. You can now turn off the screen borders and, even better, have the program come up without them so that you have two more lines of text on-screen.

The impressive features we knew and loved are still there: the outliner, mail-merge, and the thesaurus. Word's outliner is fully integrated; a function key switches between outline mode and normal editing. In outline mode, paragraphs are labeled as text or headings, and you can use as many heading levels as you need. The outliner can collapse or expand text and headings,

move entire sections of text by moving the heading level, and automatically renumber sections. Even if you don't use outlines, the automatic renumbering feature can be valuable.

For those who like giving commands through the mouse, there is little change from earlier versions of the program. You can use the mouse to mark text, move the cursor, and point and shoot at commands.

Those who would rather ignore the mouse will find it even easier to do so now that macros and additional function-key commands provide more shortcuts through the nested menu structure. Changing window size is the one task that remains easier to handle with the mouse than without it. As before, the transpose command for characters and words is available only through the mouse. But a fast typist will find it easier to retype two words than to hunt up the mouse and use the transpose feature.

MIGHTY MERGE Word's mail-merge feature is among the best around. It can request information from the keyboard, calculate new fields at print time, skip records or print individualized letters based on conditional fields, or insert one document within another. The master document lets you use variable names that are self-explanatory, such as city, state, and ZIP code. The data file uses comma-delimited or tab-delimited format.

Microsoft Word has a limited ability to mix text and graphics. If you're using a PostScript printer, you can embed commands to print graphics print files as part of a file. An interesting new option, announced in November, is *Pageview*. For \$50, *Pageview* will let Word users preview page layouts in bit-mapped graphics with Windows 2.0 or with a runtime version of Windows that comes with it. *Pageview* will let you move page numbers, change page breaks and margins, and paste graphics into the document from the Windows clipboard. However, even on an EGA monitor, individual letters lose readability in *Pageview* except in the program's zoom mode, which shows partial pages.

Version 4.0 maintains Word's style sheets, a feature that lets you customize styles such as print enhancements, line spacing, margins, and other formats, and then change them item by item with a two-letter code.

Word's thesaurus is a program-specific version of the excellent *Word Finder*. With 220,000 words in the *Word Finder* lexicon, the thesaurus turns up lots of synonyms and rarely comes up empty.

Alas, Word does have some flaws. The spelling checker works outside the main program, so it's clumsy to use. And Version 4.0 still doesn't know how to repaginate.

EDITOR'S CHOICE



FACT FILE



Microsoft Word,
Version 4.0
Microsoft Corp.
16011 NE 36th Way
Redmond, WA 98073-9717
(206) 882-8080
List Price: \$450

Requires: 320K RAM, two disk drives, DOS 2.0 or later.

In Short: Packed with features, and now lightning-fast on an AT. The ability to toggle between text and graphics mode is an exceptional extra. Not copy protected.

CIRCLE 167 ON READER SERVICE CARD



More Network Guts Than Most Network Boards

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CIRCLE 394 ON READER SERVICE CARD

WORD PROCESSORS

nate on the fly. Text columns aren't shown as columns on-screen except in preview mode with *Pageview*. This limits you when writing certain kinds of scripts and other documents where side-by-side columns need to be read together.

Unquestionably, the few shortcomings in *Microsoft Word* are outnumbered by its other outstanding features. Microsoft clearly listened to users when it added features in Version 4.0, and the company has one of the best upgrade policies around. Version 4.0 is free to users who bought *Word* after July 1, 1987. Registered users of any version of *Word* can upgrade for just \$75. If you have any doubts about the word processor you're using now, take a good, long look at *Word*. There's a lot to like.—M. David Stone



MindReader's menu options are displayed continuously at the top and bottom of the main screen. With the *WordComplete* option set, the program offers selections of words that fit the current word's letter pattern.

MindReader

SUITABILITY TO TASK

Professional

Corporate

Personal

Legal

Desktop Publishing



MindReader is one of those pivotal products that give us a glimpse of how word processing ought to be. But like many products that break new ground, *MindReader*'s innovations could be much better implemented.

MindReader is a word processor with an artificial intelligence component designed to study your style and customize its features accordingly. Brown Bag Software acquired it from *BusinesSoft* of Annapolis, Maryland, in October, 1987, and was scheduled to release a new version in December, too late for this review.

Brown Bag says the new version will be much improved. We hope so. There's much that's interesting in *MindReader* but we found it to be more a curiosity than a word processor—at least in the original version, which we reviewed. Still, it's one

of the few programs that have enough intelligence to watch your style, learn it, and attempt to emulate it. As such, it customizes itself to your habits as you use it—including your mistakes.

Even at that, it's worth a look. *MindReader* is shareware, so you can download it from any popular bulletin board, play with it to see how well you like it, and, if you do, pay its \$49.95 price to receive full documentation and support.

MindReader offers an address book, a pop-up calculator, and a diary, which make it suitable for short business letters. Commands are almost all visible as text icons on the screen; the ten function keys in their normal, Shift, and Alt positions access pull-down menus containing several available options.

As a word processor, *MindReader* is not terribly sophisticated. For instance, it cannot deal well with long technical documents. The program can anticipate what a person will type and complete the words, saving keystrokes and effort. It might be welcomed by someone who is not an accomplished typist or who has a standard repertoire of documents that have to be

produced on a word processor. Brown Bag representatives say that this feature is also finding a market for the program among handicapped persons who enjoy having shortcuts in developing documents.

While standard phrases can be programmed into most word processors via



FACT FILE



MindReader
Brown Bag Software
2105 S. Bascom Ave.,
Campbell, CA 95008
(408) 559-4545

List Price: \$49.95, plus
\$5 shipping and handling.

Requires: 256K RAM, two disk drives (hard disk recommended), DOS 2.0 or later.

In Short: A clever program with an artificial intelligence interface that adapts the program's style to your habits—including your mistakes. A new version due out soon, however, is expected to correct the problems. Not copy protected.

CIRCLE 872 ON READER SERVICE CARD

macros or products such as *SuperKey*, *MindReader* approaches this task by trying to predict the next word that will be typed and offering a selection of words for insertion into the text.

There are two different levels of automatic support: WordComplete and Glossary. The WordComplete mode assists when a document is being typed. Every time a key sequence is recognized—say the letters *th* are typed—a pop-up window

*MindReader is one of the
few programs that
have enough intelligence to
watch your style,
learn it, and emulate it.*

appears, offering a list of words and phrases that begin with those letters. Then, if you wish to use one of the listed words, typing a semicolon or a number automatically inserts the rest of the phrase.

The program can be set up so that it learns from the person who is typing and adjusts its word offerings accordingly. For example, if you use the word *specification* more frequently than *special*, the program will offer *specification* as the first option on its list and *special* as a lower priority. But if you set the program this way, it will learn your mistakes as well and will include them among the options. The lists include six options in order of how often the program has seen you use those words. Eventually, if you don't repeat your mistakes, the mistakes will drop to the seventh position and drop off the options list. Those at the top will be the words you use most often. This would be a nice feature if you had the ability to excise the mistake immediately, but you don't. You just have to be patient.

Accessed via a single function key, the Glossary or Rolodex displays a list of available phrases or names and addresses that can be selected and entered into the document. A standard signature block such as "Yours truly, your mother" can be

entered with a single keystroke.

All this is interesting, but it can be unnerving. The program beeps whenever a selection of words is available, but it also beeps—often with no error message—when you try to do something it doesn't understand.

Every time you type a comma, it produces the space after it; after a period, it types two spaces and capitalizes the next letter. This seemed appealing until I tried to use it—it is very hard to remember to type a space after each word but not after commas and periods.

To complicate your typing further, a plural feature is available. The singular version of the word is typed in or selected; then the plural key is pressed. But press the plural key twice, and you'll have an extra plural suffix added—making, for example, the word *wordsses*.

There is a spelling checker, but it is extremely limited. It includes only 10,000 words, compared to the 80,000 found in the comparably priced *Dac Easy Word II*. In one test it queried *very, able, and page*. And it does not offer substitute words. Each flagged word must be manually edited—a cumbersome task; in one sample page in our tests, the program flagged more than 50 words. *MindReader* will build the spelling checker around words it sees you use, so the feature will become more robust with time. But again, patience, patience.

GENERIC PRINTER DRIVER *MindReader* offers a single generic printer driver, although you can access a LaserJet option through the installation menu. More printer drivers are going to be added in the new version.

MindReader offers a nifty feature to let you produce an envelope on a LaserJet. After you select "envelope" from the print option, the printer prompts you to feed in an envelope, after which the name and address are printed. In the version we reviewed, this did not work properly on the HP LaserJet Series II.

MindReader's approach to its task is novel, but in the version we reviewed nearly every aspect of the implementation was rough. There are many fine low-cost and shareware products, and, if a serious word processor is what you seek, you'd be best

advised to look into another product.

MindReader does show potential, however. By now the new version should be out, and it may be worth a look. It won't cost you anything. You'll be intrigued by it even if you don't like it as a word processor. Brown Bag plans to develop the AI component of *MindReader* into an AI shell that could be used as an add-in to any application, letting you use *MindReader's* intelligence with your favorite word processor, spreadsheet, or database. Now there's a product we could get excited about!—Caroline Halliday

MultiMate Advantage II

SUITABILITY TO TASK

Professional
Corporate
Personal
Legal
Desktop Publishing



MultiMate Advantage II, the first upgrade of *MultiMate* since *MultiMate International* was acquired by Ashton-Tate in December 1985, brings some impressive new features to an old office standard.

Priced at \$565, *MultiMate Advantage II* has enhanced its applicability for the executive who doesn't want to spend a lot of time learning the program. Ashton-Tate has added pull-down menus, a full-length keyboard template that suits both the standard and enhanced IBM keyboard, and stick-on key labels.

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through February 29, 1988

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PC CONNECTION

■ WORD PROCESSORS



Pull-down menus in MultiMate Advantage II, which you can access with a single key combination, lead you through the features found in professional word processors.

pages, date of creation, date of last edit, and the time and number of keystrokes during the last edit.


Additionally, each document can be assigned keywords. With consideration for the design and use of the document summary screens—and with the “Search document summary screens” feature—documents can be located by any one field or any combination of fields available on the document summary screen. Assigning keywords can be especially useful in an office running MultiMate Advantage II LAN, the network version, in which case several users may have documents located in a single directory.

In further consideration of the real world, Ashton-Tate extends a courtesy rarely offered by software companies: a Personal Use Extension (PUE). Realizing that many users have computers at home as well as at the office, Ashton-Tate offers the PUE as an extension of the End User License Agreement. For \$25, it allows the same end user to personally retain a copy for use on an additional computer without otherwise altering the End User License Agreement.


MultiMate's undelete has few rivals.

The last 20K of deleted material is retained in a buffer; as the buffer fills, the earlier deletions are saved to disk.

With the exception of running out of disk space, this tandem process will allow the safe recovery of anything that has been deleted from your document during the current editing session.



FACT FILE



MultiMate Advantage II, Version 1.0
 Ashton-Tate
 20101 Hamilton Ave.
 Torrance, CA 90502-1319
 (213) 329-8000

List Price: 5 1/2-inch version only, \$565; 5 1/4- and 3 1/2-inch versions, \$595.

Requires: 384K RAM, two disk drives (hard disk recommended), DOS 2.0 or later; DOS 3.3 for PS/2.

In Short: High-powered, easy-to-use, a must for dBASE users who need to mail-merge their dBASE files. Not copy protected.

CIRCLE 662 ON READER SERVICE CARD

EXTRA SAFEGUARDS MultiMate Advantage II includes two other safeguards against document detonation. The F10 function key is one of them; it can cancel virtually all commands and, when pressed to end an editing session, it automatically saves the document. The other safeguard is to use the optional default to make backup copies of documents before saving. (To exit a document without saving, you first press the Esc key and then respond Yes when the prompt asks if you want to exit without saving.) Overall, the error-handling capabilities of MultiMate Advantage II are excellent.

Other amenities include a 110,000-word dictionary, a 40,000-word thesaurus with 470,000 synonyms, 77 printer-action tables supporting 400 printers, 31 sheet-action-feeder tables, and both medical and legal dictionaries.

Documents may have up to eight snake columns, and math functions have been expanded to include addition, subtraction, multiplication, division, exponentiation, and percentages in both linear and column formats. The maximum document size is 128K, enough for most corporate documents.

MultiMate Advantage II's mail-merge capabilities work nicely with dBASE. When merging a document and using a .DBF file as the merge data file, the merge is completed by using the field names of the .DBF file as the merge item names in the document. You can specify record selection criteria—such as equal to, not equal to, less than, less than or equal to, greater than, and greater than or equal to—combined with the logical operators AND and OR. It could not be any easier!

If you are a dBASE user, MultiMate Advantage II is worth the switch. And if you purchased MultiMate prior to March 1, 1987, it is well worth paying the \$100 upgrade fee.

But MultiMate Advantage II may not appeal to some professional word processors because of its continued adherence to page orientation. Its document mode, however much of an enhancement to page orientation, still retains the page orientation origins of its predecessors.

The program's tutorial is clear, concise, and thorough. The manual is actually a collection of various smaller manuals,

each with a specific defined purpose. Each manual has a table of contents and an index with cross-references to the other manuals.

Ashton-Tate provides 90 days of free technical support and offers a wide range of extended support services ranging from \$18 for an annual subscription to *On-Line*—a monthly newsletter for *MultiMate* users—to \$150 for the annual professional support package (\$100 for each additional package if you have more than one Ashton-Tate product).

The professional support package includes credit for 20 telephone calls, an electronic mailbox, a utility disk, access to a remote debugging service, a CompuServe subscription with access to the Ashton-Tate Support Forum and \$15 worth of free access time, plus annual subscriptions to both of Ashton-Tate's monthly publications, *On-Line* and *TechNotes*.

The efforts put into improving this latest *MultiMate Advantage II* release should certainly make it more comfortable to the corporate world.—Michael L. Brown

My Word!

SUITABILITY TO TASK

Professional

Corporate

Personal

Legal

Desktop Publishing



1 2 3 4

The quintessential mom-and-pop word processor is TNT Software's \$49 *My Word!*, created by programming whiz Bruce Tonkin with the assistance of his wife, P. J. Tonkin. Together they've constructed an affordable yet feature-filled program.

Besides a full set of text-editing and print-formatting commands, *My Word!* has a sophisticated mail-merge feature, a handy calculator/equation function, and a crude but reasonable spelling checker. True to the mom-and-pop credo ("Make the kids do the work"), the program is raw

PC MAGAZINE

Feb. 1988

I have ever had a Pleasure in writing any little Reminiscence of my Pastors. You may remember the Inquiries I made among the Remains of my Relations when you were with me in England, and the Journey I took for that purpose. Now I imagine it may be equally agreeable to you to know the Circumstances of my Life, many of which you are yet unacquainted with, and expecting a Weeks uninterrupted Leisure in my present Country Retirement, I sit down to write them for you. To which I have besides some other Addendums, shewing every'd how the Poverty & Obscurity in which I was born & bred, to a State of Affluence & some Degree of Reputation in the World, and having gone so far thro' Life with a considerable Share of Felicity, the conducting Means I made use of, which with the Blessing of God, so well succeeded, my Friends may like to know, as they may find some of them useful in their own Past and so, & therefore fit to be related. That Felicity when I reflected on it, has indeed no objection to my thus now offering it to my Choice. I should have on some Occasions a Report made of the same Life from its Possessor, but asking the Advantage Authors have in a second Edition to correct some Faults of the first. So would I if I might, besides some Faults, change some of the Advantages & Events of it for others more reasonable, but this seems now & I should still accept the Office. However, since such a Report is not to be

My Word!'s Splitter utility breaks up large documents that it can't handle into manageable 25K chunk parcels. The screen leaves plenty of room for writing, since even the two status lines at the bottom of the screen can be turned off.

power, and harnessing it for your needs takes some elbow grease.

My Word! emulates the original *WordStar*'s keyboard cursor movement, Ctrl-key, and dot commands. Your feelings about early *WordStar* will determine how you feel about *My Word!* In other words, the program has too many commands to do too little.

The program doesn't emulate *WordStar*'s price tag, though. The addition of the spelling checker ups its \$49 base price to only \$59. And while *WordStar* offers a choice among levels of help, *My Word!* uses only two screenfuls of memory joggers (one for editing and one for formatting). The eye-boggling help screen is similar to that of *PC-Write*.

Like *WordStar* and *PC-Write*, *My Word!* uses a two-step document creation process (first you edit, then you print), and each step uses a different program. This makes for a very fast editor, and in general it makes for a more-complicated, albeit more-powerful, print-format process.

The program's opening menu offers three main functions (edit, print, and exit) and seven utility functions. You can by-

pass the main menu if you run the editor or printer directly from the DOS command line.

When you edit a file, a second main menu appears with seven edit, print, and return-to-DOS functions. Once the two full-screen menus are out of the way, you use the program's large, uncluttered edit-



FACT FILE



My Word!, Version 2.1
TNT Software
34069 Hainesville Rd.
Round Lake, IL 60073
(312) 223-8595
List Price: \$49; \$59 with
spelling checker.
Requires: 256K RAM,

one disk drive, DOS 2.0 or later.

In *Short*: *My Word!* offers solid word processing functionality at an attractive price, but its command structure emulates that of *WordStar*. Also, the print-format component of the program requires some effort. Not copy protected.

CIRCLE 644 ON READER SERVICE CARD

■ WORD PROCESSORS

ing screen, which reserves just two lines for the command status.

My Word! is capable of just about anything if you don't mind wading through some rather technical documentation. The text-editing component is quite manageable despite the obscure Ctrl-key command sequences.

CUSTOM BATCHES The print-format component, however, is a bit nightmarish. To begin with, you won't see any margins or line spacings displayed on the screen. Commands such as ".lm 10" (left margin

for example), but *My Word!* doesn't know how to compensate for the new character width you have just entered unless you specify that as well.

Besides being a speedy and capable word processor, *My Word!* has some enhancements that add to its usefulness. One simple command allows you to create a single-level table of contents by using a .tc command to generate the table heading and make note of the page number. A sort feature lets you sort columns in ascending or descending order.

With the calculator mode, you can take raw data from your document and perform simple calculations. The program will easily insert the results back into the text. Combined with macros (you are permitted ten macros with as many as 255 key-strokes), the built-in calculator is able to adequately perform most business math functions.

Another powerful feature is merge-print. You can create mailing labels or form letters; a number of dot commands apply solely to merge-printing, and you can read as many as 1,000 variables into a document. You can even use conditional statements (such as if...or...else).

The spelling checker is functional but inelegant. It scrolls the document on the screen and highlights each unrecognized word. You can add the word to the dictionary (for the duration of a session or permanently), correct the word manually, or ignore the word. No "guess-words" option is available.

Installing *My Word!* is easy, and its customizing options are extensive. While the program is limited to handling files of about 50,000 characters, a handy Splitter utility lets you cut large documents into parcels of 25K. The program's QuickBASIC source code is readily available, and so is the wisdom of Bruce Tonkin's technical support. And an exceptional, 30-day money-back guarantee comes with the program.

On one hand, *My Word!* reflects rare dedication, knowledge, and general attention to the user's needs. On the other hand, it also reflects *WordStar*'s command structure. *My Word!* is a thoughtful program, but the effort its bare-bones approach necessitates could lead you to call it "*My Work!*"—Robin Raskin

New York Word

SUITABILITY TO TASK

Professional

Corporate

Personal

Legal

Desktop Publishing



New York Word, Version 2.21, by Magma Software Systems, is a sophisticated, feature-packed, shareware word-processing program for \$45. You get a lot for the low price: unlimited technical support and a program that has a search-and-replace utility, automatic hyphenation, a desk calculator, macros, a spelling checker, mail-merge, a table-of-contents and index generator, footnotes, windows (up to 12 at a time), and more.

The title page of the straightforward documentation labels the program a "professional word processor," and the classification is appropriate. But don't let the power intimidate you; this program is simple enough to use for personal word processing as well. After you load the two program disks and type "WP," *New York Word* will prompt you for the name of the file you want to edit or create. There's no stumbling through menus or struggling to remember mnemonics for creating new documents or editing old ones.

Pressing Alt-M brings help when you want it: a line across the top of the screen listing the main help topics, à la *Lotus 1-2-3*. Move through the topics using the cursor keys, and pull-down windows will drop over your text, showing the subtopics of each help heading. The on-line help is not context sensitive and does not refer you to sections in the written documentation, but the program's unflagging author is available by phone when needed.

A note of warning: F1 is not the help key; hit it and you'll watch whole lines disappear. Luckily, an undelete command (Alt-U) will recover them.

Two other safety nets that novices will appreciate are an automatic backup function that periodically saves your docu-

Besides being speedy, My Word! has some enhancements that add to its usefulness. One simple command allows you to create a single-level table of contents.

of 10) and ".sp3" (triple-spaced) are embedded in the text—unseen to the naked eye, and unfortunately the results are displayed only at print time.

My Word! can do anything to the printed page—provided you can get your printer to cooperate. You'll need to create your own customized printer translation table if you expect to use your printer's full capabilities. Since the translation table must always be called MWP.TBL, you must write customized batch files if you want to use more than one printer.

The program supplies translation tables for a generic printer plus three others (Epson LQ, Diablo 630, and HP LaserJet). These can serve as a jumping-off point for customizing the table and inserting your own printer's escape sequences. Creating a translation table for print enhancements like bold, underline, and double-strike is not too difficult. But watch out if you intend to take advantage of trickier features, such as pitch, for example. You can specify the code for a change in pitch (12 cpi,

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PC WORLD commenting on the ease of operation, said, "an insurance policy for P.C. novices!" **COMPUTE MAGAZINE**: "All you add is electricity."

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opening a user manual."

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■ WORD PROCESSORS

When he found I would leave him, he took care to prevent my getting Employment
ly I might if I stay'd soon bring my self into Scrapes; and farther that my ind
ing Acquaintance of his that had got a naughty %Girl with Child, whose Friends
My Inclinations for the Sea, were by this time worn out, or I might now have
Boat for Amboy; leaving my Chest and Things to follow me round by Sea. In cross

When he found I would leave him, he took care to prevent my getting Employment
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My Inclinations for the Sea, were by this time worn out, or I might now have
Boat for Amboy; leaving my Chest and Things to follow me round by Sea. In cross
ould dry for him. It prov'd to be my old favourite Author Bunyan's Pilgrim's Pro
sol: 1 line 95 of 256 mode:0 fnt: 8 file:generic.txt

New York Word lets you open as many as 12 split windows for editing. Four split-screen windows are shown here, all with the same text from this document.

ment, as well as this reminder when you exit the editing session: "File was modified—save it?" If you answer no, the program will ask again whether you're sure you wish to before you abandon your work.

New York Word is really Cadillac shareware for experienced drivers. Pros

will appreciate the ability to create headers and footers geared to odd or even pages, split-screen editing of the same or different documents, footers that can reflect various chapter titles as well as handle page numbering, and global search-and-replace functions that can handle multiple strings in one fell swoop. (In his March 10, 1987, column, "Please Share the Software," *PC Magazine's* editor-in-chief and publisher, Bill Machrone, called this the most powerful search-and-replace mechanism this side of *XyWrite*.)

You can go into DOS and execute commands and return to your document, toggle between 25- and 43-line modes in EGA/VGA using one key, suppress widows and orphans, and spell check using the 100,000-word dictionary (50K).

A strong integrated mail-merge program is part of *New York Word*, allowing an unlimited number of record files and fields per record. It will create and print mailing lists and labels, including multicolumn labels. In addition, it has a five-function pop-up calculator, capable of first calculating numbers on-screen and then dropping calculations into the text.

What's missing is the ability to snake

columns, create the two-column format used in script writing, and display boldface and underline on-screen. And although the program will justify right and left and hyphenate automatically, you have to reformat manually when you insert text.

Alas, when testing the software, we

A strong mail-merge program will create and print mailing lists and labels, including multicolumn labels.

also found that the program has a propensity to crash when handling large files. Trying to manipulate *PC Magazine's* monster 256-line test document on a 256K machine with two disk drives but no hard disk led to an excited on-screen prompt: "Out of Memory!" The subsequent crash necessitated a complete reboot, although the program saved the document. Even on a PC with a hard disk and 640K, loading and copying the test document ended in a frozen keyboard. Writing to an occasional Ctrl-key combination also led straight to the DOS prompt, with no warning or explanation, requiring a complete reboot of the program.


Bear in mind, though, that *New York Word* is only about 2 years old and is continually being upgraded. A new version should be released in March 1988. According to the author, in the works are an OS/2 version; the ability to display and access drives, directories, and subdirectories; file management functions from within the program; and line numbering of text (for legal documents).

New York Word has a following, including a European crowd. Two user groups (in Seattle and England) are writing up a tutorial; you can get information about it when you pay the \$45 fee.

By the way, only about one-tenth of the estimated 10,000 users of *New York Word* pay the \$45 fee. The rest obtain the program free from bulletin boards, or pay any-



FACT FILE



**New York Word,
Version 2.21**
Magma Software
Systems
300 Grand St., #419
Hoboken, NJ 07030
(201) 792-3954
List Price: \$45 plus
shipping.

Requires: 256K, two disk drives, DOS 2.0 or later.

In Short: This ambitious shareware program has sophisticated features but is not intimidating for new users. You can't beat its multiple-string searching, but it tends to balk at handling large files. No copy protected.

CIRCLE 662 IN READER SERVICE CARD

At last getting organized is painless with *Nutshell Plus*



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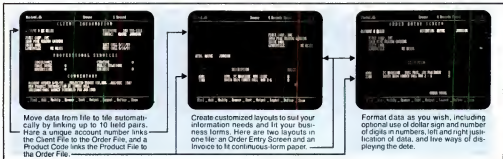
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- Eliminate empty space between and within records when printing
- Preset data to avoid rekeying of repetitive data
- Use the exponentiation operator in calculation

formulas

- Read files you created with Nutshell, its flat-file cousin

Visit your nearest retail dealer and try the **Nutshell Plus** Guided Tour Disk, then buy **Nutshell Plus**. At \$295 we think you'll find a lot to like.

For the name of your nearest dealer carrying **Nutshell Plus**, call the Canterbury International Sales Office at 1-800-637-8385 (outside of Massachusetts) or (617) 881-7404 in state.

Nutshell Plus runs on the IBM and IBM-compatible PC, XT, AT, and PS/2s. It requires 384K and DOS 2.0 or higher.

CANTERBURY
International, Inc.

Distributor of microcomputer hardware and software

Nutshell is a registered trademark of Nashoba Systems, Inc.

■ WORD PROCESSORS

where from \$3 to \$7 at flea markets or to dealers. That price will get you one disk (without mail-merge and some other features), and the first five chapters of the manual will be on it (you print it out). The full \$45 registration fee gives you the entire program plus printed documentation and phone support from the author—a real bargain.—Sylvia Helm



Dragonfly Software's \$495 *Nota Bene*, Version 3.0, seems capable of performing miracles—large and small. Even if you have a manuscript that fills multiple files on two hard disks, *Nota Bene* can produce camera-ready copy, complete with multi-level indexes and footnotes, automatically extracted bibliographies, cross-references, inserted graphics, and text in Hebrew, Russian, and Greek. But if all you want to do is write a business letter, you can place the cursor anywhere in the address, press a couple of keys, and *Nota Bene* will automatically print your envelope, with or without your business or home address—even in landscape mode on a laser printer.

Nota Bene gets its power from customized versions of XyQuest's *XyWrite* and the text-retrieval program *FYI 3000*. It has all the agility and unmatched speed of *XyWrite*, but it adds an intuitive and flexible interface all its own. If you like the command-line interface of *XyWrite*, it's still there in *Nota Bene*. But you also get Lotus-style menus combined with elaborate help screens that let you accomplish almost anything with a few keystrokes. One of the menu items even lets you integrate a few dozen help screens of your own for instant



Nota Bene's windows (three of a possible nine appear on this screen) can display text, a directory tree, or any of the program's pure-ASCII configuration files. The status line gives the current disk drive, path, filename, and window number.

access to notes or references.

The print menu lets you print the current page, selected pages, or odd or even pages and lets you download fonts. You can also type directly to the printer. *Nota Bene's* control over laser printers is impressive. Any document formatted for a laser printer will print correctly on any other printer as well.

SEARCH AND RETRIEVAL *Nota Bene's* search menu lets you customize all features of a search. Or you can press a function key and perform a simple search, then jump back instantly to where you started. A column menu lets you fill in blanks and avoid all the customary headaches of complex formats. You get justification, three levels of footnotes, and all other features in columns. And a page preview mode shows you what you'll get from the printer.

The text-retrieval system, or "text base," lets you perform Boolean searches of preindexed files and retrieve your finds into the word processor. If you don't want to index files for the text base, *Nota Bene* will search quickly through any file on disk. When you compile an index or bibli-

ography for publication, the program automatically discards duplicate entries.

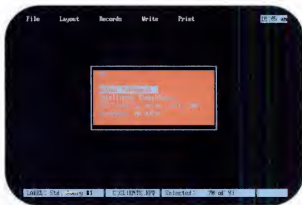
With a single keystroke you can define, delete, or even transpose any unit of text—characters, lines, sentences, and paragraphs. A single keystroke lets you jump to the next or previous unit. All operations involving words use the Ctrl key; all involving sentences, the Shift key; and all involving paragraphs, the Alt key.

This intuitive layout works beautifully on the old keyboard, less well on IBM's "enhanced" newcomer. But *Nota Bene* is one of those rare programs that provides separate on-line keyboard screens for all popular computers—including laptops. And it doesn't waste any keys. The normally neglected 5 on the numeric keypad, for example, takes you to the middle of the line.

Other keys let you switch to a screen in which you edit format codes. When working with proportional fonts that would normally require horizontal scrolling to read a full line, another key will let you toggle to a mode that breaks all lines at the right edge of the screen but still prints out correctly.

Nota Bene gives you nine windows,

Get there faster with our frequent filer program.



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RapidFile is the fastest file manager, with up to twice the speed. And twice the on-disk storage capacity of any other file manager you can buy.

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time. Especially for laptop and portable computer users.

And RapidFile is the only product of its kind that gives you the choice of pull-down menus or a Lotus® 1-2-3®-like interface. And get this—RapidFile lets you share data quickly and easily with dBASE®, Framework®, 1-2-3®, PFS:® Professional File and ASCII files.

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*While supplies last. **In Colorado, call (303) 760-4500. Ext. 274. RapidFile runs on IBM® PC or IBM® compatible. Also runs on IBM® PC, XT, AT and Novell® Advanced Network™ 16 networks. Trademarks owned by: RapidFile, Framework, dBASE, Ashton-Tate, Ashton-Tate Corporation, Lotus, 1-2-3, Lotus Development Corporation, PFS: Software Publishing Corporation, IBM International Business Machines Corp., 3Com, 3+ (3Com Corp.), Novell, Network/Novell, Inc. RapidFile is written in MMSP® (C) 1984 Miller Microcomputer Services. (C) 1987 Ashton-Tate Corporation. All rights reserved.

WORD PROCESSORS



**EDITOR'S
CHOICE**

FACT FILE



Nota Bene, Version 3.0
Dragonfly Software
285 W. Broadway,
#500
New York, NY 10013
(212) 334-0445
List Price: \$495; special
language supplements
\$95 each (all languages combined, \$195)
Requires: 384K RAM; two disk drives (hard
disk recommended); for special language
supplements, EGA, VGA, Hercules Graph-
ics Card Plus, or InColor card; DOS 2.0 or
later
In Short: A unique combination of power
and ease of use, especially suited to complex
documents, but with conveniences for every-
one. The special language versions are by
far the best software available for scholarly
use. Not copy protected.

CIRCLE 683 ON READER SERVICE CARD

easily managed by menus. One of those windows can display a directory tree. A single keystroke lets you move through two windows simultaneously, and a fast file-comparison feature lets you track changes between two versions. The program has full red-lining features, with an option to confirm every change before printing.

The spelling checker is exceptionally fast, and the program includes the capacious *Word Finder* thesaurus, which it keeps on disk rather than in RAM to conserve memory. You can make the program expand abbreviations or correct your common spelling errors as you type. Hyphenation is based on an algorithm for speed and an exception dictionary for accuracy.

Nota Bene's special language versions (at an additional charge of \$95) let you work on a PC in ways that used to be available only on a Macintosh. With an EGA, VGA, or Hercules Graphics Card Plus, you can type English from left to right, hit a few keys, and start typing Hebrew from right to left. Hebrew type wraps correctly.

Even without the special language additions, *Nota Bene* supports foreign and technical characters with unique élan. The characters are already mapped to the standard keyboard in an intuitive layout, and the program will switch instantly between

the standard American keyboard and the keyboards used in Britain, France, Germany, Italy, and Spain. Printer drivers include all foreign characters.

For legal or academic work, *Nota Bene* includes predefined page layouts that conform to standard stylebooks. You can also create your own standard style. If your article is rejected by a journal that uses one of the supplied formats, a few keystrokes will automatically convert the format to the style used by a different journal.

File conversion to and from *WordStar* and IBM's DCA format comes with the program. The program will import ASCII files and optionally strip carriage returns from the ends of lines. Dragonfly makes available a customized version of *XWORD*, from Ronald Gans Software, for conversions from other major word-processing formats.

SOME LIMITATIONS *Nota Bene* does have a few limitations. Except in preview mode, you won't see page breaks on-screen, although a page-line counter keeps track of the cursor position. The undelete function works only for words and blocks and has only one level. There's no timed backup, although a one-keystroke save function preserves your sense of security. Three lines of the screen are always occupied by status, prompt, and ruler lines, although you can replace the tab ruler with a simple dividing line.

If you don't like the way *Nota Bene* works, you can rewrite the keyboard or help files, or you can follow the lucid instructions in the manual for writing routines in *XyWrite's* programming language. You can decide whether to have continuous or broken underlining; whether to sort in American, European, or ASCII sequence; and whether the spelling checker should check words containing numbers. You can change the color of the cursor or stop it from blinking. You can even add a customized keylock.

With its thousand-page manual, *Nota Bene* scarcely looks like a program for everyone. Yet it includes conveniences that users of simple personal word processors would envy, and its elaborate features don't get in the way. The comprehensive help screens make the manual almost superfluous, and the program will even run

on a floppy-disk system—although you have to swap disks once during start-up and again when using the spelling checker or thesaurus.

Nota Bene is a bit like the Sunday paper. You can ignore everything except the sections you want, but there are enormous resources available if you need them.
—Edward Mendelson



OfficeWriter

SUITABILITY TO TASK

| Professional | 1 | 2 | 3 | 4 |
|--------------------|---|---|---|---|
| Corporate | ● | ● | ● | ● |
| Personal | ● | ● | ● | ● |
| Legal | ● | ● | ● | ● |
| Desktop Publishing | ● | ● | ● | ● |

The first version of *OfficeWriter* was introduced by Office Solutions in 1983, when the Wang-dedicated word processor was the industry standard. *OfficeWriter* helped offices make a smooth transition from Wang- to IBM PC-based word processing. Over the years, *OfficeWriter* has been enhanced to make it more competitive in today's PC word-processing market, where adherence to the Wang standard is no longer an important consideration in

(continued on page 255)



FACT FILE



**OfficeWriter,
Version 5.0**
Office Solutions Inc.
2802 Coho St.
Madison, WI 53713
(800) 228-0747
(608) 274-5047
List Price: \$495
Requires: 256K RAM, two disk drives,
DOS 2.0 or later.
In Short: *OfficeWriter* is a powerful, full-
featured, and well-designed word processor
especially suitable for corporate environ-
ments. Not copy protected.

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80286-12



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QIC 286-12C Basic system

80286-12 running at 8 and 12 MHz, speed selection from keyboard, 0 wait state design, 1MB 100ns DRAM, four 16-bit and four 8-bit expansion slots, 1.2 MB floppy / 84 key keyboard, combined floppy and hard disk controller, 192W power supply, system clock / calendar with battery backup.

EGA System.....\$1,870
Monographics System.....\$1,500

80386-16



\$1,795*

QIC 386-A Basic system

80386 running at 6 and 16 MHz, 0 wait state design, speed and wait state selection from keyboard, 1MB 120ns DRAM with 64K static RAM cache, six 16-bit and two 8-bit expansion slots, 1.2 MB floppy / 84 key keyboard, combined floppy and hard disk controller, 192W power supply, system clock / calendar with battery backup.

EGA System.....\$2,315
Monographics System.....\$1,945

80286-10



\$1,200*

QIC 286-10B Basic system

80286-10 running at 8 and 10MHz, speed selection from keyboard, 0 wait state design, wait state configurable, 512K 100ns DRAM expandable to 1024, six 16-bit and two 8-bit expansion slots, 1.2 MB floppy / 84 key keyboard, combined floppy and hard disk controller, 192W power supply, clock / calendar with battery backup, 2 serial and 1 parallel port.

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Monographics System.....\$1,350

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Featuring the Standard-286/10M™. This kit will get your business computerized in a hurry.

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Monitor - Choose either:

- a high-resolution amber monochrome monitor with 12" display screen and monochrome graphics card with parallel port, or
- a 14" EGA high-resolution color monitor and enhanced graphics adaptor card. The EGA kit includes I/O card.

Hard Drive - Seagate™ 20MB half height hard disk drive with 65ms access time.

Printer - Epson® LX-800 provides software compatibility, plus draft (150-180cps) and Near Letter Quality printing, multiple type styles, Epson Character Graphics set, dot graphics capability, and tractor/friction paper feed.

Software - Professional Zen™ Software, a totally integrated software package. ZenWord™ supports multiple type styles and over 50 printer types and features mail merge and spelling checker. ZenCalc™ provides 45 statistical and mathematical functions. ZenLink™ supports ANSI-X® and VT-100®. You can cut and paste between all Zen modules. Current versions of MS-DOS® and GW BASIC® are also included. Software comes with complete documentation.

Accessories - 200 sheets continuous-form paper, printer cable, and 10 blank diskettes.

63725 Professional Starter Kit Monographs \$1395

63726 Professional Starter Kit EGA \$1795

Career Starter Kit \$795.00

with monochrome monitor

Featuring the Standard Turbo/10™. The perfect starter system for the student, a new business, or the home.

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Monitor - Choose either:

- a high-resolution amber monochrome monitor with 12" display screen and monochrome graphics card with parallel port, or
- a 14" EGA high-resolution color monitor and enhanced graphics adaptor card. The EGA kit includes I/O card.

Printer - Star Micronics NX-1000™ provides software compatibility, plus 120cps draft and 30cps Near Letter Quality printing, multiple type styles, nine-pin print head, Epson LX-800 and IBM Proprinter II® emulation, dot graphics capability, and tractor/friction paper feed.

Software - Professional Zen Software, a totally integrated software package. Zen Word supports multiple type styles and more than 50 printer types and features mail merge and spelling checker. Zen Calc provides 45 statistical and mathematical functions. Zen Link supports ANSI-X and VT-100. You can cut and paste between all Zen modules. Current versions of MS-DOS and GW BASIC are also included. Software comes with complete documentation.

Accessories - 200 sheets continuous-form paper, printer cable, and 10 blank diskettes.

63717 Career Starter Kit Monographs \$795

63718 Career Starter Kit EGA \$1195

STANDARD AT® -COMPATIBLES



The Standard-286/12™ runs at switchable speeds of 6 and 12MHz with zero wait states. Includes 1MB RAM, internal clock/calendar with battery backup, math coprocessor socket, six 16-bit expansion slots, two 8-bit expansion slots, 1.2MB diskette drive, a dual diskette/hard disk controller, and enhanced 101 keyboard. The Standard-286/12 scores 13.7 on Norton's SI Benchmark 4.0 test.

63177 Standard-286/12 \$1149

The Standard-286/10™ runs at switchable speeds of 6 and 10MHz. The system includes 512KB RAM expandable to 1MB, internal clock/calendar with battery backup, math coprocessor socket, six 16-bit expansion slots, two 8-bit expansion slots, 1.2MB diskette drive, dual diskette/hard disk controller, and enhanced 101 keyboard.

63150 Standard-286/10 \$995



The Standard-286/8™ runs at switchable speeds of 6 and 8MHz. Includes 512KB RAM expandable to 1MB, internal clock/calendar with battery backup, math coprocessor socket, six 16-bit expansion slots, two 8-bit expansion slots, 1.2MB diskette drive, and enhanced 101 keyboard.

63105 Standard-286/8 \$945



The Standard-386/16™ uses a 32-bit, high speed bus architecture and is compatible with OS/2® and Windows 386®. The system comes with 1MB of RAM, expandable to 2MB, on a high-speed, 32-bit memory card. Further memory expansion is possible using a piggy-back RAM card. The system also comes with a 1.2MB disk drive, an internal clock/calendar with battery backup, one 32-bit memory slot (for the high-speed, 32-bit memory card), five 16-bit expansion slots, two 8-bit expansion slots, a 200-watt power supply, dual diskette/fixed disk controller, an 80287 coprocessor socket, an enhanced 101 keyboard, and Phoenix BIOS. This 16MHz system runs set software-selectable processing speeds of 4.77, 6, 8, and 16MHz and scores 17.6 on Norton's SI Benchmark 4.0 test.

63250 Standard-386/16 \$1795

STANDARD PC/XT® -COMPATIBLES

The Standard Turbo/8™ offers an 8088 processor with switchable operating speeds of 4.77MHz and 8MHz. The system includes 256KB of RAM, a math coprocessor socket, a 360KB diskette drive and controller, eight expansion slots, and an AT-style keyboard.

63010 Turbo/8 \$399

The Standard Turbo/10™ uses an 8088 processor with selectable processing speeds of 4.77 and 10MHz. The system includes 640KB RAM, a math coprocessor socket, a 360KB diskette drive and controller, eight expansion slots, and an AT-style keyboard.

63050 Turbo/10 \$495

ON®

Equity 1+™ combines power, performance, and value in a compact personal computer ideal for home or office use. Its dual speed (4.77 and 10MHz) 8088 processor and 640KB RAM deliver ample power

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62700 Equity 1+ Call for price.

62701 Equity 1+ with 360KB Diskette Drive. Call for price.

62702 Equity 1+ with 20MB Hard Drive. Call for price.



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62800 Spark \$1395



The Zenith Z-181 boasts perhaps the most advanced LCD screen available. System includes 640KB RAM and runs at 4.77 or 8 MHz. The computer has twin 720KB diskette drives and runs PC/XT-compatible software. Other features include: MS-DOS, serial port, parallel port, RGB/composite video port, interface for a hard disk, and a rechargeable battery pack with AC adapter.

62810 Z-181 \$1475



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The Zenith Z-183 offers the same built-in backlit supertwist screen as the Z-181 plus 640KB RAM (expandable to 1.6MB), a 10MB hard disk, a 720KB diskette drive, battery options, a convenient built-in handle, a serial port, a parallel port, and an enhanced keyboard.

62820 Z-183 \$1895



The Zenith Z-183-93 uses an 8088 processor and runs at switchable speeds of 4.77 and 8MHz. Other features include: 640KB RAM expandable to 1.6MB, a 21MB RLL hard drive, a 720KB diskette drive, a 10.5" diagonal, backlit, supertwist screen, MS-DOS 3.21, and an adapter.

62821 Zenith Z-183-93 \$2699



The Zenith Z-386 is a 16MHz system based on the advanced 80386 technology. Equipped with 1MB RAM (expandable to 16MB), a 1.2MB diskette drive and a 40MB hard drive, the Z-386 includes such time-saving features as an enhanced page-mode static RAM and a 32-bit memory bus.

62835 Zenith Z-386 \$4519



62807 Zenith carrying case for models 181 and 183 \$49

62809 Zenith 360KB half-height external diskette drive for the 181 model \$399

62808 Zenith 5.25" drive interface cable \$39

See page 16 for Zenith modems.

KEYBOARDS



Enhanced 101 Keyboard for AT or XT with 101 keys.

55150 Enhanced 101 Keyboard \$69



5151 Keyboard for the IBM PC, XT, AT and compatibles. Includes separate numeric and cursor key pads.

55135 5151 Keyboard \$69



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55100 5060 Keyboard \$69

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41696 Disk Drive Cover for AT. Tan rigid plastic. \$4



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41000 Head Cleaning Kit for 3.5" disk drive. \$15

41010 Computidust. \$20

41020 Screen Cleaning Kit. \$13

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41615 For 100, with lock \$6.49

41616 For 120, with lock \$7.49

File Boxes for 3.5" Diskettes

41598 For 40, without lock \$4.49

41599 For 80, with lock \$6.49

Cases for 5.25" Diskettes

41576 For 10 \$2

41577 For 6 \$1.25

Case for 3.5" Diskettes

41575 For 10 \$2

MATRIX PRINTERS

These standard office printers have dot matrix capabilities that range from speedy draft production to Near Letter Quality printing. Both wide and narrow carriages allow you to select the printer suited to your specific needs.

OKIDATA®

The 190 series maintains the sleek space-saving profile that made these printers popular. Added speed, paper handling, and compatibility features make the 190 Plus printers the best and easiest to use in their class. Prints up to 200cps in draft mode and 40cps in Near Letter Quality mode. Parallel interface. 56350 192 Plus (80 columns) \$329 56351 193 Plus (132 columns) \$499

The wide-carriage Microline® 294 is faster and more versatile than many other comparably priced printers. Printing in utility mode at 400cps and Near Letter Quality at 100cps, this printer is ideal for time-dependent applications. Handling sheets up to 16" wide, it connects by parallel port. (Not pictured). 56356 294 (132 columns) \$849



OKIDATA

The Microline 292/293 series of printers offer high-quality dot-matrix printing with enhanced graphics capability. IBM®-compatible, these printers reproduce graphics, spreadsheets, and text files using a dual 9-pin print-head and a special Lotus®-compatible driver. They print 240cps in draft mode and 100cps Near Letter Quality. Parallel port. Interface kit included.

56356 292e (80 columns) \$459

56357 293e (132 columns) \$599



PANASONIC®

Model 1080i is a 10" printer operating at 120cps in draft mode and 24cps in Near Letter Quality mode. Proportional spacing, print mode selector, and high resolution graphics make this an all-around printer for everyday office needs. Parallel interface. 56370 Model 1080i (80 columns) \$179



PANASONIC

Model 1592 prints at 180cps in draft mode and 38cps in Near Letter Quality mode. (132 columns) Parallel interface.

56373 Model 1592 \$449

Model 1595 prints at 240cps in draft mode and 51cps in Near Letter Quality mode. (132 columns) Parallel and serial interface.

56374 Model 1595 \$479

PANASONIC

Model 1091i prints at 160cps in draft mode and 32cps in Near Letter Quality mode. A 10" printer, this model offers all the features of the 1080i with increased speed. (80 columns) Parallel interface.

56371 Model 1091i \$199



PANASONIC

Model 1092i prints at 240cps in draft mode and 48cps in Near Letter Quality mode. Proportional spacing, high resolution, dot-addressable graphics, and downloadable characters make this printer ideal for any business use. (80 columns) Parallel interface.

56372 Model 1092i \$349



EPSON®

Model LX-800 provides the quality and software compatibility you expect from Epson plus draft (180cps) or Near Letter Quality printing (30cps), multiple type styles, Epson Character Graphics set, and dot graphics capability. (80 columns) Parallel interface. 56301 LX-800 \$219



EPSON

The EX series of dot matrix printers is ideal when you have a large volume of printing to be done. They print 300cps in draft mode and 60cps in Near Letter Quality mode. A choice of type styles customizes your print jobs.



EPSON

The LQ series features a 24-pin print head that creates letter quality printing on a dot matrix printer. An economical machine that creates good-looking printed material. The printer contains a 6KB buffer with serial and parallel port interfaces. LQ-800 prints 180cps in draft mode and 60cps in Letter Quality mode. LQ-850 and LQ-1050 print 264cps draft mode and 88cps Letter Quality mode. 56332 Model LQ-800 (80 col.) \$439 56334 Model LQ-850 \$599 56333 Model LQ-1050 \$799



EPSON

The FX series dot matrix printers have been industry standards for many years. These new additions are built with meticulous attention to detail to ensure performance durability. Printing 240cps in draft mode, 48cps in Near Letter Quality mode, these printers can boost your printing output quickly and efficiently.



56320 Model EX-800 (80 columns) Parallel/Serial Interface. \$469
56321 Epson Model EX-1000 (132 columns) Parallel/Serial Interface. \$659



56310 Model FX-86e (80 columns) Parallel Interface. \$399
56311 Model FX-286e (132 columns) Parallel Interface. \$579

PRINTER STANDS

38755 Roll 'N Fold Stand for 80-column printer keeps paper neat and out of the way. \$22

38756 Roll 'N Fold Stand for 132-column printer \$30



38760 Universal Printer stand is made of heavy-duty plastic and holds any size printer. (without tray) \$6

38761 Universal Printer Stand (with tray) \$12



38765 Multifunction printer stand for 80-column printer with under-printer drawer (plastic) \$16.50

38749 No Frills Metal stand for 132-column printer \$20

38748 No Frills Plastic stand for 80-column printer \$9

BUFFERS

These high quality buffers increase productivity by allowing you to print and compute at the same time. These buffers connect with Centronics parallel interfaces. Numbers in parentheses indicate computer/peripheral.



38900 64KB Buffer (1 / 1) \$79



38901 64KB Buffer (2 / 1) \$99



38902 256KB Buffer (1 / 1) \$119



38903 256KB Buffer (2 / 1) \$139

PRINTER RIBBONS



| | | | |
|-------|-------------------------|-------|-------------------------|
| 37900 | Epson LX-80 \$6 | 37955 | Okidata 192/193 \$10 |
| 37902 | Epson FX-286e \$6 | 37956 | Okidata 292e \$10 |
| 37901 | Epson FX-88e/LX-800 \$6 | 37957 | Okidata 293e/294 \$12 |
| 37930 | Epson EX-800 \$12 | | Panasonic 1080i, 1091i, |
| 37915 | Epson LQ-800 \$8 | | 1092i, 1592, 1595 \$12 |
| 37916 | Epson LQ-1000 \$10 | | |
| 37917 | Epson LQ-2500 \$10 | | |

PRINTER SOUND ENCLOSURES



Kensington® Printer Muffler controls noise and makes your printer a more pleasant office companion.
38795 Printer Muffler for 80-column printer \$45

TRACTOR FEEDS



| | | | |
|-------|--------------------------|-------|--------------------------|
| 37801 | For Epson FX80/FX85 \$45 | 37851 | For Okidata 292e \$46 |
| 37802 | For Epson LQ-800 \$49 | 37875 | For Panasonic 1595 \$119 |
| 37803 | For Epson LQ-1000 \$55 | | |
| 37850 | For Okidata 192+ \$49 | | |



38796 Printer Muffler for 132-column printer \$59

CONTINUOUS-FORM COMPUTER PAPER



| | |
|-------|---|
| 35016 | White, 9.5x11", 1400 sheets \$11 |
| 35020 | White, 9.5x11", 2500 sheets \$19 |
| 35010 | White, 9.5x11", 250 sheets \$5 |
| 35035 | Green bar, 15x11", 650 sheet \$11.50 |
| 35036 | Green bar, 15x11", 2500 sheets \$25 |
| 35025 | Pastel, 9.5x11" (50 ea. pink, ivory, canary, blue) \$7.50 |
| 35026 | Bright, 9.5x11" (50 ea. red, yellow, green, blue) \$7.50 |
| 35610 | Mailing labels, 5000 (1 across, 1x3") \$12 |



TAPE BACKUP SYSTEMS

Protect the valuable data and software stored on your hard disk with regular tape backups. Transferred to tape, your data is safe in case of power or computer failure and can be stored in a different location. Software is included with each backup system.

- 45900 20MB Internal Tape Backup \$389
- 45951 60MB External Tape Backup \$849
- 45950 60MB Internal Tape Backup \$757
- 57801 20MB Tape Cartridge \$21.99
- 57850 60MB Tape Cartridge \$29.95



POWER SUPPLIES

Replace your current power supply if it is worn out or not powerful enough for your system.

- 40700 150-watt replacement power supply for PC/XT. \$69
- 40701 200-watt replacement power supply for the AT. \$119
- 86011 200-watt replacement power supply for the Mini AT. \$79



POWER CENTERS

P25 Power Center by Computer Accessories Corp. can save space, make your peripherals work better together, and save time as well. It allows you to control the power(on/off) for your computer and peripherals from a central location while protecting your computer system with superior IEEE Class A and B power conditioning. (UL listed).

- 40653 P25 Power Director \$54



PC TOOL KITS

PC Tool Kit by Curtis - includes everything you need to repair, maintain, and upgrade your computer system. The vinyl case contains eleven demagnetized tools, including a patented chip inserter/straightener.

- 41130 Tool Kit \$18



POWER ACCESSORIES

A loss of power or a sudden surge of power can cause serious damage to your computer and erase valuable data. These accessories protect your system from unpredictable weather or current.



SURGE SUPPRESSORS

- 40525 Safe Strip, 6 outlets, (2 switched) 7' cable. 1 year warranty \$17
- 40500 4-outlet power strip \$8
- 40501 6-outlet power strip \$9
- 40502 6-outlet basic surge protector with circuit breaker \$12
- 40503 6-outlet full surge protector with surge indicator light \$15
- 40504 6-outlet full surge protector with light and noise filter \$16
- 40506 4-outlet full protector with light and noise filter and EMI-RFI filtration \$14
- 40505 6-outlet full protector with light and noise filter and EMI-RFI filtration \$19
- 40527 Curtis® Diamond® 6 outlets, switched, lifetime warranty \$28
- 40528 Curtis Diamond Plus® includes modem protection \$39
- 40529 Curtis Emerald® 6 outlets, 6' cable, built-in circuit breaker, warranty \$33
- 40530 Curtis Ruby® 6 outlets, EMI-RFI filtered, 6' cable, circuit breaker, warranty \$45
- 40531 Curtis Ruby Plus® includes modem protection \$55



Computer Service Kits- are handy versatile kits that keep all the necessary tools for maintaining your computer right at your fingertips.

Basic Tool Kit Includes chip inserter, extractor, 3-claw holder, tweezers, four screwdrivers, four nutdrivers, and torque screwdriver in a vinyl case.

- 41131 Basic Tool Kit (8 pieces) \$12

Soldering Tool Kit includes chip inserter, extractor, anti-static wrist strap, coiled ground cord, soldering iron, desoldering tool, various solder tools, pliers, and clippers in a vinyl case.

- 41132 Soldering Tool Kit (16 pieces) \$39

Advanced Tool Kit includes chip inserter, chip and square chip extractors, anti-static wrist strap, multiple screwdriver with six extensions, two nutdrivers, and two torque screwdrivers in a vinyl case.

- 41133 Advanced Tool Kit (32 pieces) \$49

Troubleshooting Tool Kit includes chip inserter, chip and square chip extractors, anti-static wrist strap, multiple screwdriver with six extensions, two nutdrivers, and two torque screwdrivers, a logic probe, a logic pulser, and a 3-piece tweezer set in a vinyl case.

- 41134 Troubleshooting Tool Kit (64 pieces) \$99

HOW TO ORDER

BY PHONE

Use the order form to plan your purchases, then call the number above between 8am-9pm Monday - Friday or 9am - 5pm Saturday, CST. Our salespeople will be happy to answer your questions and take your order. We accept VISA and Master Card. COD orders (\$50 minimum) must be paid for with a money order or cash.

BY MAIL

Complete the adjacent form and mail it to CompuAdd, 12303-G Technology Blvd., Austin, Texas 78727. Be sure to include your name and address and method of payment. We accept VISA, MasterCard, cashier's checks, money orders, and personal checks. COD orders must be paid for with a money order or cash (\$50 minimum). Purchase orders are accepted from rated companies and institutions.

SHIPPING INFORMATION

Please add 2% of your order to cover shipping and handling costs (minimum \$2). Next-day or second-day UPS service is also available - call for details and prices.

When you receive your order, check it carefully to ensure that all the items you purchased are present and in good condition. Occasionally we ship a partial order; this will be noted on the invoice. Claims for incomplete orders must be submitted within ten days. If there is a problem or question about your order, contact us immediately.

If your order has been damaged in transit, contact the nearest UPS office immediately and file a claim. You must do this within ten days and must keep the original shipping carton for UPS' inspection. The carrier is responsible for damage incurred during shipment.

WARRANTY INFORMATION

CompuAdd provides a limited one-year warranty on most of the products it sells. For specific warranty information, please ask our salespeople or write to the address above.

RETURNS

CompuAdd offers a 30-day money-back guarantee. All items must be shipped insurance and freight prepaid, and accompanied by a return merchandise authorization (RMA) number. All returned items must be in original, like-new condition, including all packaging material and documentation. We will not accept returns sent COD.

[illegible]

SPECIALY PRICED ITEMS



Genius® 402 full page monitor by Micro Display Systems makes desktop publishing, form generation, and computer-aided design easier and faster. It features a 66-line high resolution (736 x 1008 pixels) black-on-white character display. The Genius monitor is compatible with major desktop publishing and graphics software packages. This monitor package also includes a special text and graphics video adapter card with parallel printer port.

51250 Genius 402 \$1299



Orchid TinyTurbo 286™ Accelerator Board

The 80286 processor on the TinyTurbo gives your XT the power of an AT. High-speed cache memory lets some programs run even faster than on an AT. The Tiny Turbo 286 also runs at conventional XT speed (switch-selectable), for complete software compatibility.

48601 Tiny Turbo 286 \$299



P15 Power Director™ by Computer Accessories Corporation includes five power outlets, IEEE Class A and B power conditioning, and a master power switch. The UL-listed Power Director can also reduce desktop clutter and save space: it features an expansion slot which can accommodate the F10 Print Saver or Q1000 Data Director described below.

40652 P15 Power Director \$79



Q1000 Data Director™ lets you connect two peripherals to one computer port. It plugs into the P15 Power Director sold above.

40655 Q1000 Data Director \$45



F10 Print Saver™ lets you continue to use your computer while your printer is printing. Its 64KB printer buffer is easily expandable to 256KB. Installs in P15 Power Director above.

40654 F10 Print Saver \$149

ABOUT COMPUADD AND PC SOURCE:

OUR BEGINNINGS

CompuAdd Corp. was established in 1982 as a mail-order company specializing in diskette drives and hard drives for personal computers.

Since then, CompuAdd and its subsidiary PC Source have become a leading distributor and manufacturer of computers, add-on products, and accessories.

THE PRESENT

In December, 1987, *Inc.* magazine rated CompuAdd as the third-fastest growing privately-held company in North America.

We've been able to achieve this phenomenal growth because we offer the best possible products and customer support, at competitive prices.

THE FUTURE

CompuAdd continues to grow, and in new directions. We have several retail outlets in Dallas, Austin, and San Antonio, Texas. The State of Texas recently awarded CompuAdd a contract to sell computers and peripherals to state agencies.

Our emphasis on price, quality, and support will continue to serve our customers in the mail-order, retail, corporate, and institutional markets.



IBM-compatible 14" EGA monitor offers the best value in an enhanced color monitor. Its industry standard 14" tube with 13" diagonal offers .31mm dot pitch and high resolution. **51201 14" EGA \$349**



51101 Princeton HX-12 \$439

Princeton® PGS HX-12 is a color monitor with a .31mm pitch, 690x240 line resolution, and 15MHz bandwidth.



51200 Princeton HX-12E \$479

Princeton HX-12E is an enhanced color monitor with a .28mm pitch, 770x350 line resolution, and 20MHz bandwidth.



NEC Multisync II®, one of the finest EGA monitors available, adjusts to any horizontal synchronization frequency between 15.5KHz and 35KHz. It has a resolution up to 800x560, and supports both TTL and analog inputs. The 14" display has a 30MHz bandwidth and .31mm dot pitch. **51202 NEC Multisync II \$559**



IBM-compatible color monitor with 12" screen. **51100 12" color \$279**



51000 Samsung 12" curved \$89

Samsung™ 12" curved screen amber monochrome monitor with TTL input.*



51004 Quadram 12" \$119

Quadram® 12" is a high-resolution amber monochrome™ monitor with TTL input.*



Samsung 12" flat screen amber monochrome monitor with tilt/swivel base and TTL input.* **51001 Samsung 12" flat \$95**



51002 Amdek 300A \$129

Amdek® 300A for Apple or IBM is a composite 12" amber monochrome monitor. It requires color card to work in IBM compatibles.



51003 Amdek 310A \$129

Amdek 310A is a 12" screen, high-resolution amber monochrome monitor with TTL input.*



51006 Amdek 410W \$159

Amdek 410W is a black and white display 12" flat screen monitor with TTL input.*



Genius® 402 by MicroDisplay Systems with full page, 66-line, display and adept. The Genius is compatible with all major desktop publishing software. The full-page display eliminates the need for time-consuming scrolling and test printing. The Genius is ergonomically designed with black characters on a white background. High-resolution, bit-mapped graphics make it a natural for use with form generation, document storage, and computer-aided design.

51250 Genius 402 \$1299



*TTL input requires an IBM-compatible monochrome card. See page 14

VIDEO COMBOS



**Flatscreen
Monographics
Combo**

Includes Samsung 12" flat screen monitor with tilt and swivel base, and monographics video card.
51700 Flatscreen mono combo \$139



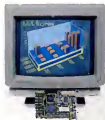
**Color Graphics
Adaptor
(CGA) Combo**

Includes 12" color monitor and color card.
51701 CGA combo \$329



**Enhanced Graphics
Adaptor
(EGA) Combo**

Includes a 14" industry standard tube with 13" diagonal EGA monitor and EGA card.
51702 EGA combo \$479



**Ultimate EGA
Combo**

Includes the NEC Multisync II monitor and a Video Seven Vega Deluxe EGA card.
51703 Ultimate EGA combo \$789

VIDEO CARDS

Upgrade or enhance your system with quality video cards in monographics, color, or enhanced graphics.



Video Seven® Vega Deluxe™ is an Enhanced Graphics Adaptor (EGA) card for the IBM-PC family. Fully compatible with all popular video standards, including color graphics, monochrome and monographics cards. It supports enhanced color, regular color and monographics displays. Capable of 37% higher resolution with the NEC Multisync or other multisynchronous monitors and appropriate software.

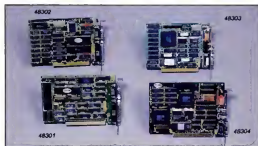
48378 Video Seven Vega Deluxe \$249

Hercules™ Monochrome Graphics Card Plus is the world's best-selling graphics and printer adaptor board for PC-compatibles. Monochrome display with high-resolution graphics and text display output. Parallel port.

48350 Hercules Mono \$179

Hercules Color Graphics Card has color graphics and printer port for the PC on a space-saving half-size card.

48351 Hercules Color \$149



Monographics Card is a high-resolution monochrome graphics card, includes parallel port.

48301 Monographics \$79

Color Graphics Card provides high-resolution color graphics adaptor that operates in both color and composite mode and includes a parallel port.

48302 Color Graphics \$69

Enhanced Graphics Adaptor 350 Card is IBM-EGA compatible, has 256KB display memory, high resolution graphics mode, and displays 64 colors, 16 at a time. It supports color, enhanced color, and monochrome displays.

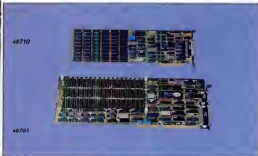
48303 EGA-350 \$149

EGA-480 is an IBM/EGA-compatible card with 256KB display memory, and 16/64 color capability. The 480 automatically configures itself to graphics mode providing a resolution of 640x350 or 640x480, depending on your monitor.

48304 EGA-480 \$169

MULTIFUNCTION CARDS

Multifunction cards provide additional RAM, ports, clocks, and various other features.



384KB Multifunction Card with 384KB RAM, parallel port, serial port, game port, clock/calendar with battery backup, and utility software.

48710 384 MFC \$199

AT-Multifunction Card with 0KB is expandable to 1.5MB. Supports either 64KB or 256KB chips and has serial and parallel ports.

48701 AT-MFC \$139



AT-MFC Memory Piggyback with 0KB expandable to 1.5MB.

48901 MFC piggyback \$25

Second Serial Port Option for XT or AT -input/output card or AT MFC.

48900 Second Serial port \$20

ACCELERATORS

These cards increase the speed of computation and processing to Turbo speeds (higher than 4.77MHz).



Charge Card 286™ gives your PC or XT the power of an AT.

48602 Charge Card 286 \$269 



Orchid Tiny Turbo 286™ Board gives your PC or XT the power of an AT.

48601 Orchid Tiny Turbo 286 \$299 



RAM CHIPS

Come in sets of 9 and with a one year warranty.

50603 256KB chip set for AT (80 nanoseconds) \$50

50600 256KB chip set (100 nanoseconds) \$46

50601 256KB chip set for AT (120 nanoseconds) \$42

50602 256KB chip set (150 nanoseconds) \$40

50501 64KB chip set (120 nanoseconds) \$22



MATH COPROCESSORS

Math coprocessors speed up all your calculations.

8087-3 Math Coprocessor (5 MHz)

50200 8087-3 \$129

8087-2 Math Coprocessor (8 MHz)

50201 8087-2 \$159

80287-6 Math Coprocessor (6 MHz)

50250 80287-6 \$219

80287-8 Math Coprocessor (8 MHz)

50251 80287-8 \$269


80287-10 Math Coprocessor (10MHz)

50252 80287-10 \$349

80387-16 Math Coprocessor (16MHz)

50275 80387-16 \$525

80387-20 Math Coprocessor (20MHz)



50277 80387-20 \$779 



IBM PC CARDS

EMS

EMS lets your computer do the talking. They connect you to other computers through local or national networks providing for easy communication and transfer of data over existing telephone lines. The higher the baud number, the more quickly your data is transmitted.

Intelligent 1200 baud external modem
 49525 1200 baud external \$89 
 Intelligent 1200 baud internal modem 1/2 card, software included.
 49500 1200 baud internal \$69 


MEMORY CARDS

Extra memory increases the operational speed of most programs.



Mem-576 short card supports either 64KB or 256KB chips. It comes with 0KB and is expandable up to 192, 384, or 576KB.



48100 Mem-578 \$39
 AST RAmPage/2[®] expanded memory board comes with 64KB RAM and DESQview[™] software.

48151 AST RAmPage/2 \$229 
 XT EMS Card (Expansion-Memory-Specification) for the XT, with 0KB expands to 2MB and is compatible with the Lotus/Intel/Micro-soft specification. Includes virtual RAM disk and print-spooler software.

48101 EMS for XT \$99
 EMS Card for the AT is compatible with the Lotus/Intel/Micro-soft specification and has 0KB expandable to 2MB. Includes virtual RAM disk and print-spooler software.

48102 EMS for AT \$119
 Intel[®] Above[®] Board 286 for AT/PC/XT supplies three memoryboards in one: conventional, expanded, and extended. Includes 512KB expandable to 2MB.
 48175 Above Board \$349



Intelligent 2400 baud internal with software.
 49553 2400 baud internal \$139 
 Intelligent 2400 baud external modem without software.
 49557 2400 baud external \$159 
 Everex Evercom[™] 1200 baud internal modem, 1/2 card, software included.
 49502 Everex 1200 internal \$99
 Everex Evercom 2400 baud internal modem 1/2 card, software included.
 49551 Everex 2400 internal \$189
 Everex Evercom 2400 baud external modem without software.
 49575 Everex 2400 external \$239



Hayes[®] Smartmodem[®] 1200 baud external modem. Requires serial port and cable.
 49501 Hayes 1200 external \$319
 Hayes Smartmodem 1200B internal modem, 1200 baud, 1/2 card with Smartcom II communications software.
 49526 Hayes 1200B internal \$299
 Hayes 2400B internal modem, 1200 baud, without software.
 49552 Hayes 2400B internal \$449
 Hayes 2400 baud external modem without software.
 49578 Hayes 2400 external \$469
 Zenith 1200 baud internal modem
 62805 Zenith 1200 external \$209
 Zenith 2400 baud internal modem for Z-183 models.
 62806 Zenith 2400 internal \$549

INPUT/OUTPUT CARDS

Add a serial device or an additional parallel port to your system with an economical I/O card.

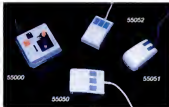


I/O Card for IBM and AT-compatibles with serial port and parallel port.
 48000 I/O for AT compatibles \$50



I/O Card for IBM and PC-compatibles with serial port, parallel port, game port, end clock/calendar with battery back-up.
 48001 I/O for PC compatibles \$55

POINTING DEVICES



MOUSE

Essential for desktop publishing applications as well as graphics, the mouse is also useful in many other programs by providing easy cursor movement on the screen.

Logitech Serial Mouse[®] is a programmable mouse with three buttons to position data, create graphics or select, copy, and edit text. Includes software and manual. PC Magazine Editor's Choice. Serial port interface required.

55050 Logitech Serial Mouse \$70

Logitech Bus Mouse[®] is a three-button optical/mechanical mouse that offers high resolution (200 dpi) and maximum compatibility with most software.

55049 Logitech Bus Mouse \$89

Microsoft[®] Bus Mouse[®] mechanical mouse includes bus interface that doesn't require the use of a serial port.

55051 Microsoft Mouse \$119

Standard Brand Mouse[™] is a three-button optical/mechanical/rotational mouse that is compatible with the Microsoft Serial Mouse and Mouse Systems PC Mouse.

55052 Standard Brand Mouse \$55 

JOYSTICK

JOYSTICK, a gaming necessity for the IBM PC and compatibles, helps you move quickly from one location to another and execute game commands.

55000 Joytack \$19.95

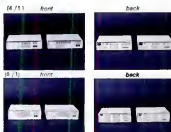
Data Switch Boxes

Switch boxes allow several PCs to share the same peripherals, without expensive networking hardware and software. Switch boxes are available with either DB25F or C36F connectors.

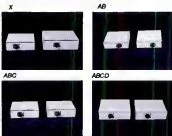
Automatic switching devices

are ideal for offices where multiple users share peripherals.

Particularly helpful to users of laser printers, these devices automatically queue print jobs. Numbers in parentheses reflect computers/peripheral. As many as eight computer users can share a common printer.



- 38952 Serial Auto Switch (4/1) \$79
- 38953 Serial Auto Switch (8/1) \$89
- 38950 Parallel Auto Switch (4/1) \$79
- 38951 Parallel Auto Switch (8/1) \$89



Manual switching devices allow multiple users to share peripherals or a single user to use many peripherals with the flip of a switch. Numbers in parentheses reflect computers/peripherals.

25-Pin:

- 39506 X Switch Box (2/2) \$23
- 39500 AB Switch Box (2/1) \$15
- 39502 ABC Switch Box (3/1) \$19
- 39504 ABCD Switch Box (4/1) \$23

36-Pin:

- 39507 X Switch Box (2/2) \$23
- 39501 AB Switch Box (2/1) \$15
- 39503 ABC Switch Box (3/1) \$19
- 39505 ABCD Switch Box (4/1) \$23

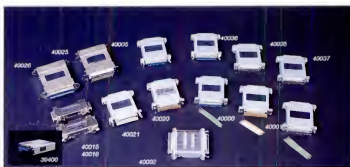


Computer Stands

- 41555 Vertical System Stand \$13
- 41556 Computer Floor Stand (metal) \$19

CABLES

- 39625 Parallel Printer Cable 6' (DB25M to C36M) \$8.95
- 39627 Parallel Printer Cable 10' (DB25M to C36M) \$11.95
- 39660 AT Serial Pigtail Cable 2' (DB9F to DB25M) \$4.95
- 39661 AT Serial Cable 6' (DB9F to DB25M) \$7.95
- 39663 AT Serial Cable 10' (DB9F to DB25M) \$10.95
- 39655 XT Serial Cable 6' (DB25F to DB25M) \$7.95
- 39657 XT Serial Cable 10' (DB25F to DB25M) \$10.95
- 39700 Full Pin Cable 6' (DB25M to DB25F) \$7.95
- 39702 Full Pin Cable 10' (DB25M to DB25F) \$10.95
- 39690 Full Pin Cable 8' (DB25M to DB25M) \$7.95
- 39692 Full Pin Cable 10' (DB25M to DB25M) \$10.95
- 39695 Full Pin Cable 6' (DB25F to DB25F) \$7.95
- 39697 Full Pin Cable 10' (DB25F to DB25F) \$10.95
- 39705 Centronics® Cable 6' (C36M to C36F) \$10.95
- 39707 Centronics Cable 10' (C36M to C36F) \$13.95
- 39710 Centronics Cable 6' (C36M to C36M) \$10.95
- 39712 Centronics Cable 10' (C36M to C36M) \$13.95
- 39610 Keyboard Extension Cable 6' (M-F) coiled \$6.95
- 39615 Monitor Extension Cable 6' (DB9M to DB9F) \$6.95
- 39600 Monitor Power Extension Cord 6' \$5.95
- 39675 HP Serial Cable 6' (DB25F-DB25M) \$7.95
- 39677 HP Serial Cable 10' (DB25F-DB25M) \$10.95



Converters

- 39400 Serial to Parallel Converter \$39
- 39401 Parallel to Serial Converter \$39

Null Modems

- 40035 Male to Male \$5
- 40036 Male to Female \$5
- 40037 Female to Female \$5

40002 Mini-Tester (M-F) MB340 \$7

40005 Surge Protector RS232 (M-F) \$5

Gender Changers

- 40015 Male to Male (DB9) \$4
- 40018 Female to Female (DB9) \$4
- 40020 Male to Male (DB25) \$4
- 40021 Female to Female (DB25) \$4
- 40025 Male to Male (C36) \$8
- 40026 Female to Female (C36) \$8

Jumper Boxes

- 40000 Male to Female \$4
- 40001 Male to Male \$4



Monitor Bases

- 41565 Tilt/Swivel Base 12" \$12
- 41566 Tilt/Swivel Base 14" \$14

Call now for great savings!

SOFTWARE

We have available the most popular software on the market for every computing need. Each package comes with complete documentation and is the latest version fresh from the premier software developers. All are designed to work on IBM-compatible hardware.

Communications

- 59000 MicroStuf "Crosstalk" \$99
 59105 Hayes "Smartcom II" \$85
 59110 Subscription Kit to CompuServe® \$21

Database Management

- 60600 Ashton-Tate "dBase III Plus" \$409
 60605 PFS "First Choice" \$79
 60610 Borland "Reflex" \$82
 60615 Symantec "Q&A" \$199
 60102 Migent "Ability" \$59

Languages

- 58200 Borland "Turbo BASIC" \$57
 58201 Borland "Turbo Pascal" \$57
 58235 Microsoft "Quick BASIC Compiler" \$61

Security

- 58595 MPPI "Coffee Break" \$21

Spread Sheets & Integrated Packages

- 60100 Lotus "1-2-3" \$329
 60101 Lotus "Symphony" \$449
 60110 Ashton-Tate "Framework II" \$345
 60120 Mosaic "Twin" \$49
 60130 Paperback "VP-Planner" \$49

Desktop Publishing & Graphics

- 59400 Aldus "Pagemaker" \$545
 59405 Xerox "Ventura Publisher" \$469
 61050 Broderbund "Printshop" \$35
 59425 Springboard "Newsroom" \$31
 59800 Mouse Systems "PC Paint" \$53
 61015 Unison Word "Printmaster Plus" \$29
 59815 Digital Research "Gem Draw" \$159
 59420 Prosoft "Fontasy" \$35
 59820 Micrographix "Windows Draw" with clip art \$172

Finance

- 60800 MECA "Managing Your Money" \$116
 60805 Monogram "Dollars & Sense" \$99
 60810 Timeworks "Sylvia Porter's Personal Finance" \$55



Games

- 61500 Microsoft "Flight Simulator" \$31
 61510 Sublogic "Jet" \$32
 61511 Sublogic "Scenery Disk" Dallas, Ft. Worth \$13
 61512 "Scenery" Los Angeles, San Francisco, Las Vegas \$13
 61513 "Scenery" Washington DC, Chir, Miami \$13
 61520 Broderbund "Where in the World is Carmen San Diego" \$24
 61521 Broderbund "Where in the USA is Carmen San Diego" \$26
 61522 Epyx "Destroyer" \$24
 61523 Sierra-On-Line "King's Quest II" \$27
 61524 XOR "NFL Challenge" \$59
 61527 Microprose "F-15 Strike Eagle" \$21
 61528 Spinnaker "Sargon III" \$25

Utilities

- 58536 Norton's "Utilities Advanced" \$75
 58535 Norton's "Utilities" \$49
 58597 Westlake Data "PC Fullbak" \$49 (Free with hard drive purchase).



- 58555 Fifth Generation "Fastback" \$92
 58560 Softlogic Solutions "Disk Optimizer" \$29
 58565 Central Point Software "Copy II PC" \$18.50
 58566 Central Point Software "PC Tools" \$19
 58575 Executive Systems "X-Tree" \$25
 58580 Funk "Sideways" \$40
 58015 Microsoft "Windows" \$59
 58585 Borland "Side Kick" (not copy-protected) \$48
 58598 Westlake Data "Pathfinder" \$32

Word Processing

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 60010 MicroPro "Word Star Professional" \$239
 60015 Word Perfect Corp. "Word Perfect" \$209
 60020 PFS "Professional Write" \$115
 60025 Ashton-Tate "Ultimate Advantage II" \$259

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- 61000 Microsoft "Learning DOS" \$32
 61020 Simon & Schuster "Typing Tutor III" \$29
 61025 Davidson & Assoc. "Math Blaster" \$26
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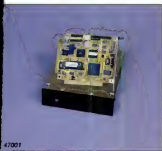
- 57000 360KB DS/DD \$7
 57200 1.2MB DS/HD \$15
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47104 FlashCard-30MB \$339

47208 FlashCard-49MB \$595 [Save](#)



47002 Seagate 20MB half height hard drive (65ms) \$289

47000 20MB 3.5" half height hard drive kit for Compeq Portable \$299 [Save](#)

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47204 MiniScribe 43MB high performance drive full height (28ms) \$569 [Save](#)

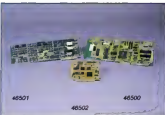
47400 MiniScribe 71MB high performance drive full height (28ms) \$799 [Save](#)



47003 Seagate 20MB hard drive half height (65ms) \$299

47207 Seagate 40MB hard drive half height (30ms) \$479 [Save](#)

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45301 Teec 360KB floppy diskette drive for PC (black) \$109

45351 Teec 1.2MB floppy diskette drive for AT (grey) \$119

45350 1.2MB floppy diskette drive for AT (grey) \$109

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BUT IS IT DESKTOP PUBLISHING?

Word processing programs are encroaching on the low end of the desktop publishing market with features like graphics in text and snaking and side-by-side columns.

The changes we'll see in new PC-based word processors over the next year will mark the extension of word processing software into the lower end of the desktop publishing market.

The idea is simple enough: give users some of the features we've come to associate with desktop publishing, without the expense, learning curve, difficulties, and delays of the best-known desktop publishing programs.

In many businesses, the elegant, professional look of reports, proposals, contracts, sometimes even ordinary business letters—when produced with *PageMaker*, *Ventura Publisher*, or another of the burgeoning crop of PC-DTP programs—has become very popular.

But managers and professionals in those firms have also come to know (and bemoan) the delays that are the price of that "DTP look." Reports that once took a few hours to get "typed" now take a day and a half; proposals that took a day take a week; even simple business letters that once took just a few minutes now take an hour or more, as the PC-DTP wizards fiddle and futz around with getting things just right.

There must be a cost- and time-effective answer, they say, that falls somewhere between the straight-text limitations of traditional word processing and the illustrated, designed look of full-blown desktop publishing.

That answer, it's now clear, lies in so-called "converged WP-DTP" products, which have been in development by the leading word-processing vendors for more than a year. In fact, DTP-like features have already begun to appear in many of the top word-processing programs.

A START Almost all the market leaders can accommodate "typeset-look" typefaces on laser printers, whether built

into the printer or added via plug-in cartridges or downloaded "soft fonts." Several programs can now insert, position, and even scale graphics, such as 1-2-3 graphs or *Freelance Plus* drawings. Many PC WP packages offer line-drawing tools, sometimes including variations in line width. A few offer box drawing, though rarely in combination with the proportionally spaced typeset-look fonts, such as Times Roman and Helvetica, that we've come to associate with DTP documents.

Both the newest version (4.0) of *Microsoft Word*, released last September, and the upcoming Version 5.0 of *WordPerfect* show that these market leaders haven't been asleep. *Word* has long been at the head of the pack of PC word processors when it comes to typesetting-like controls, such as interline spacing and paragraph leading. The latest *Word* offers additional low-level, DTP-like features to extend that franchise.

The *WordPerfect* people jumped in early with the ability to place graphics in mainly text WP documents, and in Version 5.0 they extend that facility, while adding other features well-suited to very simple DTP documents. *WordStar 2000* has also added features oriented toward the user who wants the sophisticated look of DTP without the need to buy and learn a desktop publishing program. In fact, Leon Williams, CEO of MicroPro International Corp., has coined the term "word publishing" to describe the look and feel of DTP in *WordStar 2000*.

But none of these packages truly represent the converged WP-DTP tribe we'll see coming to prominence in 1988, because all are bound by the character-oriented nature of MS-DOS and the PC. None, for example, can begin to show users true WYSIWYG, particularly in terms of seeing actual typefaces and type sizes on-screen.

GRAPHICAL INTERFACES That's a job for a graphical environment, and it's going to be one of the early rewards of a move toward *Windows* and then OS/2 Version 1.1's Presentation Manager interface.

Once we start treating the PC's screen as a palette upon which programs can draw objects, we're into true converged WP-DTP country. And an object can be a word made up of 12-point italic Helvetica type, or a *Microsoft Excel* graph, or a corporate logo, or a large-type headline, or a bold rule separating one passage from the next.

Microsoft has been widely rumored to be developing a *Windows*-based extension of *Microsoft Word*, also due under OS/2 Version 1.1. A quick preview of that program, in very preliminary form, is impressive. It shows fonts accurately on-screen (though bound by *Windows'* own type-size limitations); it has an elegant, Macintosh-like page-preview feature, and it allows easy insertion, positioning, and scaling of graphic images.

Given the modest graphics orientation of *Word* from its first versions, and especially given the long-standing, almost theological commitment of the company to the idea of graphical-interface software, Microsoft seems to have a natural lead in this area.

What's not clear yet about this so-called "*Windows Word*," as well as other vendors' converged WP-DTP entries, is what the cost of these graphical displays will be in terms of performance. A substantial advantage of a character-oriented PC display, for example, is speed: you don't have to wait while the whole screen is being redrawn.

WordPerfect and *XyWrite*, especially, have focused on producing fast, nimble word processing programs that exploit that inherent speed advantage, and they in effect have spoiled us. Speed isn't

everything in word processing... but speed in computing generally is additive; once you've used a fast program, it's awfully hard to move to a slower program of that type, no matter what the additional features.

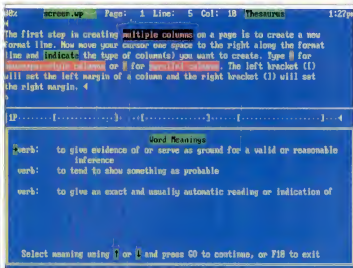
SPEED TRAPS If converged WP-DTP programs wallow around in their graphical interfaces, slowing text entry—the largest part of the WP job—to give us more control in the much smaller text-formatting part of the job, users are likely to steer clear of them.

If, on the other hand, these new converged WP-DTP programs are literally smart enough to match roughly the speed of the current PC WP leaders (through intelligent programming, handling much of the busywork of formatting and screen management in the background between keystrokes), then we're likely to see these new programs slowly take over the mainstream business word processing market.

Not everyone cares so much how their processed words look on paper, and not everyone has at hand the laser printers, scanners, graphics creation and editing programs, and other hardware and software tools needed to make the most of these new kinds of word processors. But as the use of DTP grows, and as more businesses discover the greater impact and readability of better-looking documents, the demand for DTP features in a simpler, easier-to-use WP setting will grow apace.

Someday, all word processing products will include as a matter of routine most of what we today call desktop-publishing features. For the next year, the game is going to be to bundle into fast, graphically oriented word processors just the right set of DTP features—not so many as to slow the program intolerably, nor so many as to make it as difficult to use as a full-fledged DTP program.

That's a fine line, and users will have fun watching the big players in PC word processing trying to find that line. And sometimes, certainly, falling on their faces.—**Jim Seymour**



OfficeWriter's thesaurus is called from the Special Edit Functions menu. It presents you with a synonym list for the word that you select.

most offices. Office Solutions released its current offering—*OfficeWriter*, Version 5.0—in November 1986, bearing a premium price tag of \$495.

It doesn't take long to get started with *OfficeWriter*—the interactive disk-based tutorial should help first-time users learn their way around the program's logical command structure in a very short time. The program makes use of full-screen menus that indicate the available function-key choices. Almost every feature in the program can be accessed using a function key—alone or in combination with the Shift, Alt, and Ctrl keys. Function-key templates and quick reference guides offer further help.

The program uses two lines at the top of the screen for nontext information. The status line indicates the character column, line, and page number of your cursor's current position. It also tells you the name of the file you're working on and displays the current DOS time.

Directly beneath this is a ruler line, which you can use to set margins, tabs, columns (both snaking and newspaper style), and vertical spacing—making it easy to see exactly where you have

changed the format of your document.

OfficeWriter offers an impressive array of formatting features. Full microspace justification and proportional spacing will give you great-looking output (assuming you have a printer that supports proportional spacing). You can adjust your right margin to accommodate up to 250 characters per line and make an unlimited number of margin changes in a document. *OfficeWriter* allows single-, double-, triple-, half-, quarter-, and 1½-line vertical spacing. You can indent a block of text from both right and left margins, but you can center only one line of text at a time.

Most text editing is done by selecting the operation you want to perform, defining a block, and then pressing the Go key (the Plus key on the numeric keypad, although this assignment can be changed). With a single keystroke you can define a word, line, sentence, paragraph, column, or page as a block, and you can easily move or copy defined text from one document to another.

OfficeWriter still clings to an exceedingly cumbersome method of text insertion. The program operates primarily in overwrite mode, which is undesirable for

■ WORD PROCESSORS

documents of any length. In the current version, the text following the point of insertion drops down one line when you choose to insert text. This is an improvement over earlier versions of the program, which dropped the text to the bottom of the page, but the next version of *OfficeWriter* should offer the user a choice of a true push-ahead insert mode as well as a choice of an overwrite mode.

OfficeWriter's search-and-replace feature lets you use the asterisk as a wildcard, with the number of asterisks determining the number of wildcard characters in the search string. Search and replace is case sensitive. You can search for and replace format codes, and you can view each successful search before the replace operation is performed.

MACRO LANGUAGE *OfficeWriter* uses a fairly powerful macro language. An unlimited number of macros are available for use at any time, and these can be edited, can pause for keyboard entry, and can include some commands. However, the macros do have some limitations. Macros cannot be used to run other macros, and they cannot utilize logical operators.

When you're ready to print, the Print Document screen lets you set the top and left margins, the number of lines per inch, the number of lines per page, the default font, and the number of bins if your printer uses a sheet feeder. You can also select the page on which headers, footers, and page numbering will begin. If you want to continue working on a document while another is printing, you can send output to the spooler and then queue documents for printing.

OfficeWriter implements the 80,000-word Proximity Merriam-Webster Linguistic spelling checker and a 40,000-root-word thesaurus from the same source. This spelling checker is fast and convenient to use. It goes through the document highlighting unknown words one at a time, while the entire document remains on your screen. Best guesses for the correct spelling can be listed, and the misspelled word is automatically replaced when you choose the correct spelling. You can automatically add words to a user dictionary so that they won't be flagged in the future. The spelling checker also finds double words

and is case sensitive. In addition to spell-checking the entire document, you can spell-check single words or pages within a document.

Some other features included in *OfficeWriter* are automatic hyphenation, orphan and widow control, up to 15 newspaper-style or snaking columns per page, up to 60 fonts per document, support of 43- or 66-line screens (if your monitor allows this), line and box drawing, five-function math, mail-merge, table of contents and index generation, outlining, and sorting on up to seven fields.

A separate telecommunications module called *OfficeExpress* is available for an extra \$100, and *OfficeGraphics* lets you manipulate and inset graphics into your document for an additional \$145.

OfficeWriter 5.0 is well designed and therefore easy to use, apart from the annoyance of the drop-down insert mode. The program offers many of the sophisticated features demanded in corporate and professional word-processing environments. Its premium price, however, puts it into direct competition with programs such as *WordPerfect* and *XyWrite*, which provide a broader range of features. But compared with *MultiMate*, the other prominent Wang descendant, *OfficeWriter* is much easier to use and in many ways it proves itself to be the superior product.

—Catherine D. Miller

Palantir Word Processor

SUITABILITY TO TASK

Professional
Corporate
Personal
Legal
Desktop Publishing



Palantir Word Processor, Version 3.0, \$395 from Palantir, is a product without a solid market niche. At its best it's a foreign-language word-processor/mail-

merge. But deletions and other changes produce awkwardly shaped text until you issue the reformatting command; then you need to issue a second command to break a document into pages. Error handling is poor. In these respects, the program is not really suited to the novice user.

Palantir is not likely to please power users either. While it offers several sophisticated features, their implementation is embryonic compared with the standards set by today's powerhouse word processors. A multiline header or footer, for example, is composed of several single-line headers and footers. And don't look for footnotes, print queuing, or the ability to edit more than one document at a time.

FOREIGN LANGUAGES *Palantir* has two outstanding functions: an easy-to-use method of producing foreign-language characters and a powerful and intelligently designed mail-merge (called mail-out).

The program models its approach to producing characters from foreign languages—like the *ñ* in *señor*, the *ç* in *garçon*, and the *è* in *père*—on that used by typewriters. On a typewriter keyboard, the foreign letters and signs are assigned to dead keys. In *Palantir*, you press the ScrollLock key to activate the dead key mode. For example, if you type a comma, nothing will be entered in the document until you type the next character. If the next character is a *c*, it is added to the comma to produce a *ç*, and a composite character bearing the cedilla will appear. If the next character is a *d* or some other character for which no composite is available, the characters will print sequentially as *,d*.

MAIL-OUT The mail-out feature includes a simple but flexible programming language. The language allows you to skip passages or include them on the basis of information in the data file. For example, a marketing letter could include a paragraph about regional specials that varies with each prospect's ZIP code. Logical operators (OR, AND, and NOT) along with relational operators (greater than, less than, and equal to) allow you to include specific paragraphs in only those letters addressed to, for instance, women between 19 and 45 who live in New York.

Setting up a merge that prompts you for

**For the
Randolph Hearst
in all of us...**



TAXAN

WORD PROCESSORS



The F5 key activates Palantir's Search function. However, Palantir was unable to recognize "Pleasure" even though it was displayed prominently in the document.

data is relatively uncomplicated. The ability to do simple arithmetic calculations enables *Palantir* to produce invoices and even to customize dunning letters based on the amount owed and the customer's rating. *Palantir*'s mail-out can read a number of file formats directly, including comma delimited, fixed field width, and its native format, in which each line is separated by a

hard return. The commands also include the ability to skip a file header. If you are familiar with *dBASE*, you can set up a letter that uses *dBASE* files directly without any intervening translation. While setting up a merge letter may require some sophistication, using a merge that prompts for data at print time and creating a merge data file are both straightforward operations.

SPELLING CHECKER The spell-checking routine is powerful but awkward. While testing the feature we were enthusiastic about its ability to offer a two-word pair such as *look in* as one of its choices for the misspelling, *lookin*. Although the spelling checker is a separate module, you can invoke it using *Palantir*'s run command. However, poor screen design mars the spelling checker. While a more descriptive menu appears on-screen, only bulletin board hackers are likely to decipher easily the cryptic question of "A,I,#L,R,D,V,U,E,Q,M,A or F# [A]" that awaits your response. Although you cannot select the document you wish to spell-check by merely pointing to it, the speller will oblige by presenting a list of files starting with the first letter of your

document—which is fine as long as you remember the first letter and can get the spelling checker started.

The program has other useful, albeit minor, virtues. Search and replace will function with format codes as well as with characters or words. The word mode works nicely, recognizing words followed by a comma, an exclamation mark, or other punctuation. On the negative side, before permitting the execution of an automatic replace procedure throughout the document, *Palantir* requires you to go through one manual search and replace. The program reads in and saves files that lack the suffix .wp as ASCII files. While this method sacrifices use of the file extension as a means of organizing files, it allows *Palantir* to serve as a text editor as well as a word processor. Thus *Palantir* will not accidentally save text files as word processing files and vice versa.

SOME DRAWBACKS Even if these features are just what you need, we advise caution before choosing *Palantir*. The number of ways in which the program can crash, thereby losing data and time, is disturbing. The manual repeatedly suggests saving before printing—with good reason: trying to print without an on-line printer may crash the program.

The documentation has some startling omissions, such as the key combination (Ctrl-Left or -Right Arrow) for moving by word. While *Palantir* does offer a choice of spacing tables for true proportional printing, choosing the correct spacing table can be tricky. Furthermore, the manual fails to mention that the cross-reference option on the installation menu can help you choose spacing tables or install a substitute printer driver.

Palantir's many little problems are bearable singly but become irritating when considered cumulatively. When we tested subscripting and superscripting, neither worked on the HP LaserJet II, IBM Proprinter, or NEC Spinwriter. And *Palantir*'s keystroke sequences are frequently cumbersome. Printing a single page starting at the documentation screen, for example, requires visiting two other screens and using a minimum of eight keystrokes.

Palantir Word Processor is available in 42 foreign languages, including Chinese,



FACT FILE

Palantir Word Processor, Version 3.0

Palantir

12777 Jones Rd., #100

Houston, TX 77070

(713) 955-8830

List Price: \$395

Requires: 256K RAM,

two disk drives, DOS 2.0 or later

In Short: *Palantir* has a superb mail-merge facility and an efficient method for producing foreign characters, but it is marred by poor error handling, inadequate documentation, and cumbersome and inefficient keystroke sequences. Not copy protected.

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WORD PROCESSORS

Japanese, and Korean. Its method of producing foreign characters makes it attractive in that territory, when teamed with a carefully chosen compatible printer. But for unaccented English-language word processing, it doesn't speak the same language as the competition in its price range.

—Judy Housman

Paperback Writer

SUITABILITY TO TASK

Professional

Corporate

Personal

Legal

Desktop Publishing



1 2 3 4

Paperback Writer, a \$39.95 program from Paperback Software, is for those who would rather not worry with the fancy features available in many word processors. It is for someone who wants to knock out short memos or letters without having to wade through a lot of menus or documentation.

The program is almost identical to Paperback Software's *Executive Writer* (which sells for \$69.95) but has fewer features. If you won't miss these features, *Paperback Writer* is worth considering. It is clearly designed and simple to use.

Paperback Writer cannot produce headers and footers, so features like the ability to position page numbers, dates, or titles isn't there. You can print page numbers, but you have no control over where they are printed. They must appear centered at the bottom of the page, and numbering always begins with 1.

Paperback Writer has no way to alter margins and line spacing from within a document. These items may be set only once, just prior to printing. There are no provisions for footnoting or indexing, nor for subscripts and superscripts. There is no way to invoke special print styles on dot matrix printers, such as double width or letter quality text.

Editing: Old File test

only asking the Advantage Authors have in a second Edition to correct some Faults of the first. So would I if I might, besides, corr the Faults, charge some sinister Accidents & Events of it for others more favourable, but tho' this were deny'd, I should still accept the Offer. However, since such a Repetition is not to be expected, the Thing most like living one's Life over again, seems to be a Recollection of that Life; and to make that Recollection as durable as possible, the putting it down in Writing.

Hereby, too, I shall Indulge the Inclination so natural in old Men, to be talking of themselves and their own past Actions, and I shall Indulge it, without being troublesome to others who thro' respect to Age might think themselves oblig'd to give me a Hearing, since this may be read or not as any one pleases. And lastly, (I may as well confess it, since my Denial of it will be believ'd by no body) perhaps I shall a good deal gratify my own Vanity. Indeed I scarce ever heard or

Insert Off Document On Boldface Off Underline Off
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

All functions in *Paperback Writer*, including printing, are invoked from the editing screen. Labels at the bottom of the screen remind you of each function key's purpose. These labels change when the Shift, Alt, or Ctrl key is pressed.

These limitations, however, also guarantee that *Paperback Writer* will work with almost any printer. There is no printer installation routine, a procedure that many novices find harrowing. The only print attributes that are supported from within the program are underlining and boldfacing.

Paperback Writer includes basic search-and-replace capabilities, but they are somewhat limited. Searching is always done forward from the cursor position; there is no way to distinguish whether text stands alone as a word or if it is part of a larger word—for instance, a search for his would also locate *this*. There are no wild-card characters, so it is difficult to make any kind of approximate match. Capitalization is always observed, so a search for *football* would miss any occurrence of that word at the beginning of a sentence.

Another limitation is *Paperback Writer*'s inability to import from or export to a disk. Documents created with *Paperback Writer* must be edited and printed with *Paperback Writer*.

You will find block operations. A block can be any section of text, be it a word, sentence, paragraph or an entire docu-

ment. The beginning and end points of a block are indicated by moving the cursor to a spot and pressing a function key. Marked blocks are highlighted on the screen and may subsequently be moved, copied, or deleted. It is also possible to change the print attributes of a marked block: for ex-



FACT FILE



Paperback Writer,
Version 1.0
Paperback Software
International
2830 Ninth St
Berkeley, CA 94710
(800) 255-3242
List Price: \$39.95

Requires: 128K RAM, one disk drive, DOS 2.0 or later.

In Short: An abbreviated version of *Paperback Software's Executive Writer*. Easy to learn and use, but lacking in features that would make it much more than a letter-writing program. Copy protected, but manual includes a procedure that voids copy protection.

CIRCLE 657 ON READER SERVICE CARD

ample, an existing paragraph of normal text may be marked and converted to underlined text.

Consistent with the Paperback Software product line, *Paperback Writer* is inexpensive; it is packaged as a single floppy disk that is bound inside the manual. The documentation is clear and straightforward, with a 30-page introductory section that covers most program functions. The manual avoids almost any digression that might manage to confuse a novice user. Steps that require you to use DOS commands are explained fully. A section on hard disk procedures and a glossary are included as appendices.

Function keys control all operations,

Consistent with the Paperback Software product line, Paperback Writer is inexpensive.

including formatting, block manipulation, disk access, and printing. Function keys are frequently used in combination with the Shift, Ctrl, and Alt keys. A display on the bottom line of the screen always serves as a reminder of each key's purpose. The program includes an on-screen help facility that explains how most special keys are used. The user presses F1 for help and then is prompted to press another key. An explanation of that key is then displayed.

Tab and margin positions, as well as the current filename, are displayed while a document is being edited. Indicators show when bold or underline modes are being used. However, no page, line, or column numbers are displayed, so it is possible to lose track of your position.

Several important *Paperback Writer* key combinations would not work on the Compaq Portable III. Technical support people at PSI also warned that similar problems may crop up with the new 12-function-key keyboards.

If you need a program to do simple, straightforward letter writing, consider *Paperback Writer* but also investigate *Ex-*

ecutive Writer. It is only slightly more expensive and has a lot more to offer. *Executive Writer* is also simple and easy to use, and the manual is not much thicker than *Paperback Writer*'s. The extra features in

Executive Writer can easily be ignored, but they are there if you need them someday. *Paperback Writer* is appropriate only if its limitations are considered a virtue.

—David L. Hoffman

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1987



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■ WORD PROCESSORS

PC-Type Plus

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ButtonWare's *PC-Type Plus* has a split personality. This \$69.95 program, released in November 1986, is extremely sophisticated, but it has its drawbacks.

Big features abound in this little package. For example, *PC-Type Plus* gives you ten windows. It does mail-merges and recovers up to ten deleted lines. The program performs alphabetical case-sensitive searches.

PC-Type Plus has so many flashy features, however, that its omissions seem all the more glaring. If you want to backspace through a sentence that stretches over two lines, the cursor won't jump up to the previous line. The search-and-replace function doesn't recognize a string of words split over two lines. You can't print a file without calling it up first. Most annoying is that paragraphs have to be manually reformatted after editing, and, when you do reformat, the cursor jumps to the next paragraph, instead of allowing you to edit

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PC-Write - Version 2.71 Feature Summary

For Beginners: Easy to learn with tutorial, Quick Guide, and 45 help screens. Easy to use with menus or function keys. Complete 360-page User Manual with index.

For Typists: Very fast operation. Instant 50,000-word spell checker, auto paragraph reformat, decimal tabs, on-screen ruler, footnotes and endnotes with auto numbering, and record/playback keystrokes.

For Writers: Fast search and replace with wild cards. Move, copy, delete, reformat, and shift blocks of text easily. Automatic index and table of contents, left/right page layout, and place-saving bookmark.

For Business: Mail merge with prompted and default values. Works with over 350 printers, supports LaserJet(tm) and PostScript(tm) with microjustification. Option to use Wordstar(tm) commands and files.

For Programmers: ASCII files, search for non-ASCII, jump to line number, bracket match, block indent, and temporary margins.

For Advanced Users: DOS command shell, keyboard and print macros, many configurable features, color/attribute control, printer customization, split screen to edit two files, annotated directory, and screen clip text from other software.

Requirements

IBM(tm) PC, AT, or PS/2; 320K RAM



FACT FILE



PC-Type Plus,
Version 1.0
ButtonWare Inc.
P.O. Box 5786
Bellevue, WA 98005
(800) JBUTTON
(206) 454-0479
List Price: \$69.95

Requires: 256K RAM, two disk drives,
DOS 2.0 or later.

In Short: Although a little clumsy on the basic blocks and moves, this bargain-priced package offers mail-merge and ten windows for editing. Not copy protected.

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FREE!

Elements of Style

PC Magazine
February 29, 1988

Ask for a free copy of this timeless guide to writing style when you order *PC-Write* Shareware Diskettes or Full Registration. Let *PC-Write* and Strunk & White help you with your writing. (While supply lasts. Offer expires April 1, 1988.)

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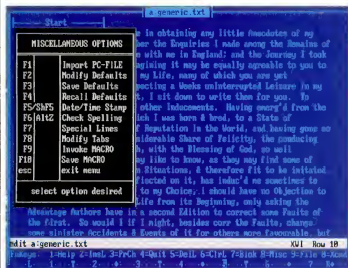
Quicksoft, Inc.

219 First North

Box #224-PMA2

Seattle, WA 98109

■ WORD PROCESSORS



With PC-Type Plus, menus indexed by function key pop up on the opposite side of the screen from the cursor and tell you the key combinations to press for the task you want to perform.

the text as you go along.

Installation takes only a few minutes and is easy enough for a novice. You can create text on 22 lines of the screen. The current filename appears at the top of the screen, while the command line, message line, and ruler appear at the bottom.

HOW IT WORKS You manipulate your document with commands and menus. The function keys pop up the menus, and the message line reminds you of the function-key functions. The menus tell you which combination of keys executes the task you want, which is great for beginners. But there are no shortcuts around the menus.

You call files, open windows, search, get detailed help, and print from the command line with easy-to-remember whole word commands. There is also a DOS shell through which you can temporarily exit the program. PC-Type Plus takes up only 105K of RAM, so there's room to do a lot without exiting the word processor.

PC-Type Plus's block controls work through mnemonic key combinations that let you first mark whole and/or partial lines and then move, copy, or delete. You can

save a marked block to its own file, add to it, or get it back later. Some editing moves are awkward; for instance, the program reinserts deleted text in the line below the cursor instead of at the cursor.

One of PC-Type Plus's best features is its straightforward and flexible mailmerge. It pulls in files from the keyboard, from a comma-delimited format (like WordStar), or from ButtonWare's own PC-File database to produce letters, labels, or lists. You can process an unlimited number of records with up to 42 fields per record. Each field can contain up to 65 characters. For the small-businessman who wants to do a lot of simple form letters, PC-Type Plus may have all he needs.

RECENT IMPROVEMENTS If you looked at an earlier version of PC-Type Plus, you may have dismissed it, but since its inception the program has improved in many ways. Previously, macros were necessary to do a search and replace; now you can designate the string from the command line. Also, you can now easily control the printed page by changing page breaks and length, horizontal offset, or header and footer definitions.

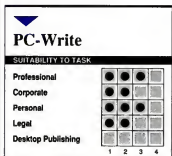
Another enhancement is the dictionary, called "fault finder." You invoke Alt-Z to check spelling. It will also catch duplicate words such as "the the" in your document. The cursor will stop on any word not in its 100,000-word dictionary, but no alternatives are offered.

PC-Type Plus imports and exports files in ASCII format. Only the available memory of your machine, the size of your read buffer, and the default line length limit how large a file you can load. The program loaded our 100K test file without complaint.

There are several layers of help. They include reminders such as the message line for the function keys; the help behind F1, which offers an index of all key combinations; and the extended help disk, which explains how to do everything from aligning columns to disabling the word wrap.

The manual is a small spiral-bound notebook crammed with small print and poorly done graphics. The documentation's simplicity reminds you that in spite of PC-Type Plus's souped-up features, this is still a \$69.95 program. However, the manual does have a comprehensive and accessible index.

If you want a program you can teach others to use quickly, if your primary need is for writing short letters, and if price is a major factor, PC-Type Plus may offer the value you want.—Posy Gering



In 1983 Bob Wallace made the rounds of computer fairs, selling his word processor for \$10, putting the manual on disk and distributing a product that everyone could copy freely.

ERASE. ARE YOU SURE?



Every computer user faces this question in some form each day. To erase or not to erase. To save or not to save, when saving means overwriting the previous version of a file. If you answer yes and you're wrong, *countless hours of work will be wiped out by a single keystroke!* And there won't be anything you can do about it, unless you're backed up.

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MaynStream's pull-down menus make it remarkably easy to back up, restore, assign names to frequently backed-up groups of files, select optional password protection, and more! And context-sensitive, on-screen help is just a keystroke away.

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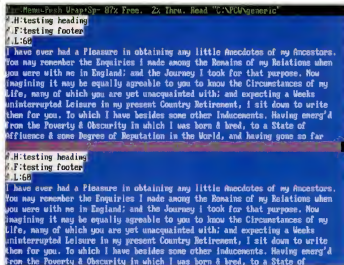


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■ WORD PROCESSORS



Typing F2 in PC-Write displays a ruler line and also splits the screen into two windows; move the cursor up or down from the ruler to access a window. Note the character at position 14 on the ruler, showing the cursor's current location.

Since then his product, *PC-Write*, has raised its relatively inexpensive price only slightly. Version 2.71's minimum package costs \$16, but there are more than 27,000 registered users collectively paying \$1.5 million a year to use and maintain it.

You install the package with a batch file that copies the files to your working disk; you can choose to transfer help files and spelling dictionaries or skip them if you are space conscious. Finally, you may select a printer from a list of choices to complete the installation. *PC-Write* also comes with definition files for Microsoft and Mouse Systems mice.

The package consists of two programs: an editor (ED) and a separate print program (PR). When you run ED, you are greeted with a shareware message and a request for the name of the file to edit. Once you select a file, you can request that a backup be made when you exit the program. You can also type ED followed by a filename to load a file directly.

One status line at the top of the screen notes the keyboard status (insert vs. over-write), edit status (word wrap, auto reformatting, text marking), and spelling

checker (on or off). In addition, it shows the amount of memory left, a relative cursor position (for example, 15 percent through the file), and the name of the file.

PC-Write uses function keys and nearly every possible combination of Shift, Ctrl, Alt, and regular keys. F2, for example, displays the current ruler. Alt-F2 invokes the spelling checker, and Shift-Ctrl-Backspace deletes from the cursor back to the beginning of a line.

If you can't remember a key combination, first type Esc for a list of function-key definitions and then type the first character of the function to use it. You indicate all word wrapping, justification, and margins in a ruler line invoked with the F2 key.

ADDING FEATURES *PC-Write* files are simply ASCII text, but you can type in special, nonprintable characters used by the print program to add features to parts of the document. To boldface, for instance, you move the cursor to the beginning of the word you want highlighted, press Alt-B, move to the end of the word, then press Alt-B again. *PC-Write* inserts ASCII character 2 (a Ctrl-B displayed as a happy face)



FACT FILE



PC-Write, Version 2.71

Quicksoft Inc.
219 First N., #224
Seattle, WA 98109
(800) 888-8088
(sales only)
(206) 282-4452

List Price: Shareware;
no cost if copied from existing user. Suggested
price, \$16, with disks available from
Quicksoft Manual, \$35. Full registration,
\$89 including disks, manual, technical sup-
port, and new-letter.

Requires: 256K RAM (320K RAM with
spelling checker), two disk drives (hard disk
recommended), DOS 2.0 or later.

In Short: A quick, general-use word-pro-
cessing package with many features, includ-
ing limited macros and mail-merge capabili-
ty, at a shareware price. Excellent personal
word processor. Not copy protected.

Circle 89 on Reader Service Card

and highlights the bold area.

PC-Write also makes it easy to copy, move, or delete text: You place your cursor at the beginning of a block of text and push F3, F4, or F6 for copy, delete, or move, respectively. You then move to the end of the block, press the appropriate function key again, and then press it a third time at the block's destination.

To help you avoid errors, *PC-Write* comes with a 50,000-word spelling dictionary. The package spell-checks all words longer than three characters as you type, chirping if a word isn't recognized. You can also spell-check in a batch mode by typing the gray Plus or Minus key after starting the spell-check function.

The print program, PR, reads the document and decodes the special characters to determine how it should look. You can print single or continuous sheets, skip or repeat pages, and accept user input for mail-merge operations. The program can also apply parameters stored in a printer definition file so you don't have to put them in each document.

WINDOWING FEATURES The package will split the screen into two windows and remind you to back up your files after a certain number of characters or minutes. It

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can generate tables of contents and indexes
and create a bookmark to which you can
jump at any time. Disk directories are dis-
played for easier file retrieval, and *PC-Write*
allows you to temporarily exit to
DOS to execute commands.

Documentation is in reference manual
format, starting with brief installation in-
structions, a short tutorial, and a descrip-
tion of the menu commands. On-line help
becomes available if you type F1 twice.

*To help you avoid
errors, PC-Write comes
with a 50,000-word
spelling dictionary. The
package spell-checks
all words longer than three
characters as you type.*

You must register the package to be eli-
gible for technical support. Full registra-
tion costs \$89 and includes diskettes, a
manual, a newsletter, and access to the
technical support staff.

One of the few problems with *PC-Write*
is its 60K file-size limit. Version 3.0, due
in the spring, will expand the limit, but for
now you'll have to break up your files. An-
other drawback is that it's almost impossi-
ble to remember all the key combinations
offered.

The special character features are in-
timidating to the novice user, and the tuto-
rial would be more helpful if it covered
more of the features. The spelling checker
works pretty well, but during the test it
stripped the apostrophes from a word
while adding it to the user word list—and
the word still showed up as incorrect.

PC-Write is a general-use word proces-
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yond the needs of the average user. You
can try out the product without cost and
buy as much support documentation as
you need. If you can get through the learn-
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Desktop Publishing



1 2 3 4

Personal QWERTY—\$99 from HFK Software—is an interesting word processor that can help ease the transition from the typewriter to PC word processing. Though modest (requiring 256K RAM and working fine with one floppy disk), it can handle some surprisingly advanced features, such as mail-merging and boilerplate documents.

If you've used another word processor or are familiar with the more-conventional key assignments and operating methods of other application programs, you might find *QWERTY* too quirky. But if until now you couldn't imagine life without the old Selectric on your desk, *QWERTY* will be a welcome surprise.

To install *QWERTY*, you simply copy the files onto a backup disk or hard disk drive and type *QWERTY*. Initialize the program with your name and choose the



FACT FILE



Personal QWERTY

HFK Software
68 Wells Rd.,
Lincoln, MA 01773
(617) 259-0059
List Price: \$99

Requires: 256K RAM
(128K with DOS 2.0),

one disk drive, DOS 2.0 or later.

In Short: A comprehensive, introductory word processing package that includes text-merge, indexing, forms-building capabilities, and many options for customizing features; users accustomed to other PC program layouts may find its unfamiliar structure disconcerting. Not copy-protected.

Circle 8 on Reader Service Card



The QWERTY main menu will not let you specify subdirectory locations, but there are a number of choices you can invoke when you load the program, including tutorial mode.

function key that corresponds to one of ten built-in color schemes for color monitors, and you're on your way. The program does not remember color assignments, though. You must set the colors for a new session by beginning the program with a *QWERTY/Cd* command, where the *d* is the number of the function key. In fact, you can use about 25 arguments to start *QWERTY* with various options.

The bare-bones main menu has five items: Create a new file, Edit an existing one, Print, List files or change disks, and Exit the program. Noticeably absent is any support for subdirectories. While you can load the program in a subdirectory, you cannot access files in subdirectories. There is room for a drive-location parameter only. Users who rely on tree-structured hard disk file management will probably be unhappy.

Unlike most word processors, which place a cursor in the upper-right-hand corner of the edit screen, *QWERTY* makes you begin entering text by typing on the bottom line of its novel edit screen. The document scrolls up instead of the cursor scrolling down. In place of a cursor that marks the current location in the text,

QWERTY uses a bizarre, horseshoe-shaped type head that sits a full line below the current entry line. Three horizontal lines (one character wide) mark the location of the next character in your typed text, but the type head is free to roam independently of these cursor lines. Trying to track the bouncing typehead can be frustrating if you're used to a more-traditional cursor.

The bottom of the screen displays the ruler line, which includes fine graphic representations of margins and tab stops. *QWERTY*'s rulers are powerful but easy to manage. You can add ruler lines anywhere in the text, each with its own margins, tabs, and format commands. You must design the ruler lines, though, by manually entering a collage of binding spaces, tabs, and margins across the screen—a task that more-powerful word processors automate by supplying a default ruler line that you can modify.

QWERTY's command structure is strange, in part because the program was created for the old-style PC keyboard with the function keys in vertical rows to the left of the keypad. The program's non-text-sensitive help screens, reminiscent of

skipping stones, are invoked with the shifted F1, F3, and F5 keys—as unlikely a combination as you could imagine. The Home key is responsible for bold text—End is for underline. The PgUp key places a user-defined binding hyphen into a word during document printing. The PgDn key is for a strikeover.

Cursor-movement is the domain of the function keys; F2, for example, moves the type head ahead one space at a time. Text editing is the domain of the shifted even-numbered function keys. When you look at the command set based on two vertical columns of function keys, you can see some method in this madness, but if you have a keypad with the function keys arrayed across the top, the keystrokes seem poorly assigned.

You can copy, move, and insert blocks of text by using Ctrl-key combinations. The blocks do not appear highlighted or marked with special characters on the

screen, and the only way to delete a block is to move it to nowhere.

Without a doubt, the most confusing keystroke in the whole program is the delete key. Press Del, and *QWERTY* tries to exit, asking you if you want to save. Users experienced with other programs will no doubt accidentally save their files a zillion times before becoming accustomed to this system. Also, *QWERTY* lacks a "Save and Resume Working" option: saving tosses you back to the main menu.

QUIRKY SEARCH Other quirks abound in the search-and-replace function. The F9 key begins a backward search, and the F10 key begins a forward search. To search, you type in your target word and invoke the command by pressing the same function key again. *QWERTY* has no verify, global search, or case-sensitive conditions.

The program formats documents using

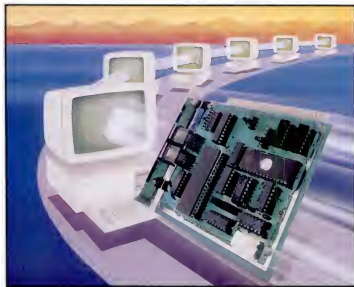
an effective system of format-indicator commands, created by pressing the Shift and Tab keys or the PrtSc key. Again, this method is slightly different from the conventional "dot" embedded commands. The powerful format indicators include items such as form size, guaranteed space (which can conditionally force a new page), and a manual pagination option.

In some ways, the novel key assignments make *QWERTY* more endearing. And its fine interactive tutorials, replete with clicking and beeping sounds and lots of user participation, are especially pleasing. They span the entire spectrum of the program's features. The program disk is also chock full of samples and documents to examine and mimic. But the 46-page written documentation ignores many of the program's features, lacks an index, and is so skimpy and superficial that it's almost useless.

But *QWERTY* is packed with hidden

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CIRCLE 314 ON READER SERVICE CARD

PC MAGAZINE ■ FEBRUARY 29, 1988

WORD PROCESSORS

potential. If you print out the summary information that follows each tutorial, the how-tos of merging boilerplate documents, creating mail-merge template documents, and inserting hidden comments in the text will unfold. *QWERTY* stores boilerplates as files that you must name with a single, alphabetic filename and then insert following a Ctrl/Alt command sequence. The Mail Merge, a separate program loaded from DOS, can merge a text document containing bracketed variables with a data document. A simple but effective index generation program allows you to create an index by using the format indicator command, *IX.

The program likes its documents short and sweet. It didn't recognize the existence of *PC Magazine's* 104K text file. To read the document, we had to rename the file with a single-letter extension (*QWERTY's* convention for forms-merge) and then merge the document into an existing open file. *QWERTY* truncated the document after 40K.

Personal QWERTY is different, fun to use, and reasonably powerful for the price. But its quirky key assignments are a drawback, and it should be a bit smarter regarding subdirectories and saving a file without making you exit the word processor. —Robin Raskin

Personal WordPerfect

SUITABILITY TO TASK

Professional

Corporate

Personal

Legal

Desktop Publishing



1 2 3 4

WordPerfect Corp. has long been recognized as a leader in the word processing world. With *Personal WordPerfect*, released last April, you get a well-documented and well-supported program that recognizes more than 300 printers, including

| Function Key | Feature | Key Name |
|--------------|------------------------------|-----------------------------------|
| F1 | Cancel | Cancel |
| Shift-F7 | Cancel Print Job | Print - 4 Printer Control |
| Shift-F6 | Center | Center |
| Alt-F8 | Center Page (Top to Bottom) | Page Format |
| F5 | Change Default Drive | List Files |
| Ctrl-F8 | Characters per Inch (Pitch) | Print Format |
| Ctrl-F3 | Colors | Screen - 4 |
| Alt-F8 | Conditional End of Page | Page Format |
| Ctrl-F4 | Copy a Block (Block On) | Move |
| Ctrl-F4 | Copy a Column (Block On) | Move |
| F5 | Copy a File | List Files - 8 |
| Ctrl-F4 | Copy Text | Move |
| Ctrl-F3 | Ctrl/Alt Key Mapping | Screen - 3 |
| F5 | Current Document Size | List Files |
| Home, Arrows | Cursor Movement | Home and Arrow keys |
| | Cursor Movement, Specialized | GoTo, Escape, Page/Screen Up & Dn |
| Ctrl-F4 | Cut | Move |
| Ctrl-F4 | Cut Block (Block On) | Move |
| Ctrl-F4 | Cut Column (Block On) | Move |

Personal WordPerfect's on-line help system is one of its strongest features. After pressing the help key (F3), simply press the first letter of the feature about which you wish information.

laser printers with multiple-font cartridges, a complete on-line help system, a speedy spelling checker and thesaurus, and an automatic outlining feature—all for a list price of \$195.

The program has many features from *WordPerfect* but leaves heavyweight features, such as math capabilities and automatic indexing, to the more expensive package.

File retrieval is done with one keystroke that identifies the current directory. Another displays the directory with filenames in alphabetical order. You can highlight the file you want or type the filename to call it.

If you are not sure of the filename, you can still call the file through a speedy text retrieval database index, as long as you know some unique words in the text.

HELPFUL REFERENCES An excellent help system guides you through *Personal WordPerfect's* features. You press the F3 key to access help and then hit the key you don't understand. For instance, to find out about outlining, you would follow F3 with F9, the outline key. If you don't remember that F9 is the outline key, simply press O instead, and you will see all of

the features that begin with O.

Formatting codes, such as underline and boldface, are embedded in the text, and you can delete and move them. If you wish to change all your boldface text to underlined, you can do so with a search-and-replace command.

The spell checker and the thesaurus are fast. The thesaurus, however, has the same



FACT FILE



Personal WordPerfect, Version 4.1

WordPerfect Corp.
288 W. Center St.
Orem, UT 84057
(801) 225-5000

List Price: \$195

Requires: 192K RAM,

two disk drives or hard disk, DOS 2.0 or later.

In Short: For those who want *WordPerfect* without its corporate features. Lacks features found in the high-end product—such as macros, mail-merge, dual document editing, hyphenation, indexing, line draw, and line numbering. Not copy protected.

CIRCLE 66 ON READER SERVICE CARD

WE'VE JUST MADE THE BEST EVEN *Better*

Peachtree Complete II: The Business Accounting System

New

The success story of Peachtree Complete (now with over 200,000 users) continues with the newest member of the Peachtree family, Peachtree Complete II. Much more than just an update, Complete II builds upon the comprehensive features that have made Peachtree the leader in small business accounting software for nearly ten years. We've added many exciting new features and designed state-of-the-art methods for using the packages. The result—all eight modules are even more powerful and easy to use, yet still priced at just \$199—a 96% price reduction from the original \$4,800.



Windows and Pop-Up Menus.

Complete II is designed for user convenience. Use the cursor throughout the system to make easy "point-and-shoot" selections. If you can't remember a customer or account number while using a program, simply open a window and scroll through your customer list or chart of accounts. Select the information you're looking for directly from the table!

Short-Cut Keys. We speed you from one function to another without the time-consuming task of manually passing through multiple menus.

Smart HELP. If you get stuck, the same function key will always bring HELP to your rescue with pop-up windows of information that relate to your individual trouble spot at both program and field levels.

Quick-and-Easy Error Handling. Complete II traps errors and gives a plain-English description of the problem along with suggested solutions.

Range Printing. Print all information on a report or select a specific range of information for print out. A great feature for restarting long reports or partial printing of certain sections.

Easiest Installation Ever. Enter your company's information once and it is reflected throughout the system. Complete II includes a separate Installation Guide, basic Accounting Primer, eight-volume Reference Library and extensive Tutorials on each package — all at no extra charge!

Ideal for Service Businesses. Enter information free form on service invoices or store pre-defined paragraphs of up to 160 characters. Enjoy full editing capabilities at time of invoice entry.

Eight Integrated Software Modules

- General Ledger
- Accounts Receivable
- Invoicing
- Accounts Payable
- Inventory
- Fixed Assets
- Job Cost
- Payroll

Complete II includes eight software modules that may be integrated or installed individually and may be distributed among separate computers. Install the most critical modules initially; add others later.

COMPARE FEATURE FOR FEATURE

System-Wide Features

- NEW Over 400 reports
- NEW Unlimited number of companies and consolidations
- NEW Automatic memo-driven conversion of your existing Peachtree Business Accounting data files
- NEW Increased numeric capacities to 9999,999,999.99 to ten areas

General Ledger

- Chart of Accounts includes 78 suggested and 25,000 user-defined accounts
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- Repeating journal entries
- NEW Fiscal statement comparisons may include current period and year-to-date with budget and/or prior period comparison
- NEW Sorting journal entries

Accounts Receivable/Invoicing

- Open item or balance forward customers
- NEW Up to 14,400 customers
- NEW Supports partial payments
- NEW 1 user-defined terms codes and aging periods
- NEW Automatic transactions with monthly, bi-monthly, quarterly, semi-annual, and annual frequency options

Accounts Payable

- Up to 14,400 vendors
- NEW Partial payments of invoices
- Job requirements forecasting by due date
- NEW 1 user-defined billing cycle on automatic invoices
- Checks printed with undated invoice listing on stub
- NEW Ability to void and reprint checks

Inventory

- Supports average, last purchase and standard costing methods
- Job requirements forecasting by due date
- NEW Up to 99,500 inventory items (SKU's)
- NEW Automatic price change on multiple items by percent or amount

Fixed Assets

- Handles 15,000 assets and 15 methods of depreciation
- NEW Updated to handle current tax laws

Job Cost

- Tracks costs and profitability on a job-by-job basis
- Compares estimated costs with actual costs for specific tasks

Payroll

- Built-in current year federal, state, city and county tax tables for all 50 states with automatic calculation capabilities
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- NEW Printed and magnetic media W-2s generated automatically



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When you purchase Peachtree Complete II directly from Peachtree Software, you're protected with a 30-Day Money Back Guarantee. If you're not satisfied, simply return the product in saleable condition within 30 days and your purchase price will be promptly refunded. (A \$20 restocking fee will be charged if disk bag is opened.)

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Requires PC/MS-DOS version 2.0 or higher with 384K of usable memory with a minimum 10 MB hard disk. For use with the IBM® PC, PC XT, PC AT, Personal System/2™ and compatibles. 3 1/2" media optionally available. IBM is a registered trademark and Personal System/2 is a trademark of International Business Machines. Not copy protected.

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How rewrote a

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We Gave It A Hot Start And Finish.

The result is MultiMate Advantage II.™



A few simple commands let you directly merge dBASE® files without leaving MultiMate. And without knowing how to work dBASE. Which makes it easy to create stacks of personalized form letters.

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menus. There's also a Hot Print feature that prints out memos at the touch of a key.

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MultiMate also supports over 400 printers, including the latest lasers.

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Fred's Encyclopedia Inc.

June 8, 1987

Mr. Steve Heston
200 N. Washington
Chicago, IL 60601

Dear Steve:

As manager of Fred's since the U.S.A., I was to personally congratulate you. The new time expansion MultiMate II.™ is now available for our American sales area.

On the basis of your letter, I have been informed of your interest in purchasing MultiMate II.™. I am sure you will find it a most useful and complete word processing system. I am sure you will find it a most useful and complete word processing system. I am sure you will find it a most useful and complete word processing system.

Best of luck at your sales expansion project. Please contact me via mail and we will be happy to assist you in any way possible. We are looking forward to your order.

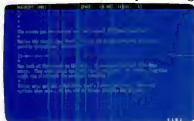
Sincerely,
Fred Heston

we bestseller.

a single document, with 18 downloadable.

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Now you can access the power of MultiMate with simple pull-down menus (left) or choose the original interface (right). Both interfaces have document mode for visible page breaks and fast scrolling.

new optional pull-down menus. So is
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■ WORD PROCESSORS

drawback as a printed thesaurus: you must enter a "head word" for it to find synonyms, and there are only about 10,000 head words.

The outlining feature is an excellent aid for creating documents. The program automatically indents and displays the next level of the outline when you press the Tab key, down to seven heading levels.

Error handling is excellent. Using Ctrl-Break, Ctrl-C, Esc, and even rebooting while saving a file did not cause any problems with file integrity. Unformatted diskettes, full diskettes, and unavailable disk drives likewise had no deleterious effect on the operation of the program.

The manual is complete, well organized, and explicit. You can also call the technical-support telephone number; the staff can answer just about any question quickly and courteously.

Personal WordPerfect bills itself as a personal word processor, but it is not for the timid. You can be up and running in just a few hours, but your best bet is to roll up your sleeves and explore the many features of this powerful yet relatively low cost program. —Leo Lefkowitz

PFS:Professional Write

SUITABILITY TO TASK

Professional

Corporate

Personal

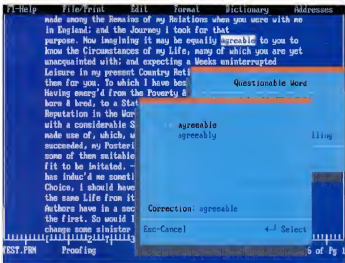
Legal

Desktop Publishing



PFS:Professional Write, Version 1.3, which lists at \$199, is the word processing package in the PFS (personal filing system) Professional Series of programs published by Software Publishing.

One of its main strengths is that you can quickly learn not only its basic functions, but also its advanced ones. Less than half an hour after opening the package, you can start creating and editing documents.



With PFS:Professional Write, generating a list of possible correct words is accomplished by selecting option 4 from the questionable-word screen. The selected word can be automatically inserted into the document.

The manual, an attractive gray spiral-bound book, opens with "How to Learn PFS:Professional Write," a one-page summary. Experienced users are instructed first to start the program by typing PW at the DOS prompt, then check Chapter 1 for an overview of the program, and then to experiment. The on-line pull-down context-sensitive help is so good that experienced computer users probably will not have to refer to the manual after their initial look. For the novice and intermediate computer user, the first 29 pages of the manual are dedicated to a "Quick Tour" of PFS:Professional Write's basic features. The balance of the manual comprises 12 indexed chapters that are presented in a logical, organized sequence and filled with step-by-step examples.

Configuring PFS:Professional Write to your specific hardware is a straightforward process. After typing PW, you are presented with the opening menu, which has only three options: Create/Edit, Setup, and Exit. Choosing Setup allows you to specify data and work disk drives, printer drivers, and screen colors.

The 66 printer drivers include the most

*Less than half an hour
after opening
PFS:Professional Write,
you can start creating
and editing documents.*

popular printers on the market. For printers not supported, you can specify printer control codes with a menu option. Only three choices of screen color plus monochrome are available, and you cannot customize them.

ILLUSTRATED FUNCTIONS Selecting the Create/Edit option from the main menu puts you into the edit mode. The function of each of PFS:Professional Write's six function keys appears across the top of the screen at all times. Pressing any of these function keys produces easy-to-follow pull-down menus. As you gain

Some of the world's biggest problems are being solved with a touch of Smalltalk.

The French Ministry of Foreign Affairs is responsible for keeping

Abroad and involved in foreign affairs.

track of every French citizen living abroad and every foreigner living in France. Each day, they process thousands of requests for documents or information, each one of which takes at least fifteen minutes. Arthur Andersen, the world's largest accounting firm, has developed a natural language processing application with Smalltalk/V that enables clerks without computer training to extract the necessary data much faster. Thanks to Smalltalk and system developers Bart Schutte and Pascal Wattiaux, what once took fifteen minutes now takes 30 seconds. Vive la Smalltalk!

On the ground floor of high-tech environmental control.

Climate, energy, fire and security are all critical aspects of environmental control in large office buildings. The challenge for Johnson Controls, a leader in this industry, is to provide a control system that is both technologically advanced and simple to operate. Using Smalltalk/V, Research Scientists Gene Korienek and Tom Wrensch have developed a prototype that integrates all environmental functions into a real-time control system using sophisticated color graphics on a PC. This enables the building engineer to immediately spot and correct problems by simply clicking a mouse. And provides building owners and tenants with a better climate for business.



The world is made of objects. So naturally, the world is turning to Object-Oriented Programming (OOPS). And the fastest, easiest OOPS language and environment is Smalltalk/V.

With OOPS you program by defining objects, their inter-relationships and their behavior. Objects can represent both real-world entities — people, places, things — as well as useful abstractions such as stacks, sets and rectangles. Smalltalk/V provides everything you need to solve problems big and small, including a comprehensive tutorial to get you started.

Who needs Smalltalk?

Because Smalltalk models the way people really think, it is perfect for scientists, engineers and professionals who have to solve tough problems in a

short amount of time. Perfect for programmers who are looking for a fast, efficient prototyping environment. And anyone who wants to quickly and easily learn OOPS.

Introducing Smalltalk/V286.

Our newest version of Smalltalk offers faster and more powerful OOPS capabilities. We've gone from 16 to 32-bit architecture. From 640K to 16 MB capacity for 25 times the memory. And designed it to run

on the next generation OS/2 operating system as well as DOS.

Get Smalltalk for a small price.

Smalltalk/V sells for just \$99.95. Smalltalk/V286 is \$199.95. The following optional applications packs are available for \$49.95 each: Communications; EGA/VGA Color; Goodies #1, Goodies #2, Carleton Tools and Goodies #3, Carleton Projects.

And everything comes with a 60-day money-back guarantee.

So visit your nearest dealer. Or call toll-free, 800-922-8255 and order direct with MasterCard or Visa. Or write to Digital, Inc., 9841 Airport Blvd., Los Angeles, CA 90045.

And let us help you put Smalltalk into action.



With Smalltalk, even non-programmers can create exciting applications. Economics Professor Arnold Katz of the University of Pittsburgh developed Economics PC Discovery World, an intelligent tutoring system for beginning microeconomics students. Using a mouse to access windows and manipulate data, a student can call up a set of markets and commodities for an imaginary community. By changing the scenario, the student can not only study a variety of market behaviors, but also test the validity of his or her own reasoning. A process that provides a lot of food for thought.

Teaching students to think economically.

Economics Professor Arnold Katz of the University of Pittsburgh developed Economics PC Discovery World, an intelligent tutoring system for beginning microeconomics students. Using a mouse to access windows and manipulate data, a student can call up a set of markets and commodities for an imaginary community. By changing the scenario, the student can not only study a variety of market behaviors, but also test the validity of his or her own reasoning. A process that provides a lot of food for thought.


Smalltalk/V

digital inc.




CIRCLE 708 ON READER SERVICE CARD

Smalltalk/V requires DOS and 512K RAM on IBM PC/AT/PS or compatibles and a CGA, MCGA, EGA, VGA, Zenith 3100, Hercules, or AT&T 6300 graphic controller. A Microsoft or compatible mouse is recommended. Smalltalk/V286 requires a 286 or 386, DOS or OS/2 and 1 MB of memory and one of the graphic controllers listed above. Not copy protected.



FACT FILE



PFS:Professional Write, Version 1.3
Software Publishing Corp.
1901 Landings Dr.
Mountain View, CA 94043
(415) 962-8910

List Price: \$199
Requires: 320K RAM, two disk drives, DOS 2.0 or later.

In Short: This word processor balances ease of learning and use with features and power; it is ideal for personal correspondence and day-to-day business communications that do not require elaborate formatting. Not copy protected.

CIRCLE 89 ON READER SERVICE CARD

experience with the program, speed keys (Ctrl-key sequences shown on the pull-down menus) allow you to bypass the menus. Ctrl-S, for example, takes you directly to the save screen, circumventing having to type F2 (File/Print) and then 2 (the menu selection for save).

Striking the F1 key brings context-sensitive help, and the Esc key always returns you to the edit mode. A ruler at the bottom of the screen shows margin and tab settings along with cursor position. (*PFS:Professional Write* supports both regular and decimal-aligned tabs.) In addition, the bottom of the screen shows you the name of the current document, insert mode, current line and page numbers, and percentage of memory used.

You usually enter text in the insert mode, but you can toggle the overstrike mode with the Ins key. You can easily mark blocks of text to be copied, deleted, formatted, saved, or printed, either through the Edit menu (F3) or with a speed key (Ctrl-T). You mark blocks of text by highlighting with cursor keys rather than by using block marker characters. To move a block of text, you mark, delete, and then "paste" it into a new location.

You can use the handy find-and-replace function to count occurrences of specific words, or—with wildcards—to count all the words in a document. The find-and-replace function is not case sensitive when searching, but it will respect case when

performing a replace. For example, if you are searching for *The*, the program will find both *The* and *the*.

The screen shows you the text in a format that is close to WYSIWYG; you see normal page breaks, headers, footers, and page numbers. But you usually specify justified text (having both left and right margins aligned) through the print menu; however, the screen does not show justification. Also not displayed on-screen are the results of special formatting commands, such as forced page breaks and if the block-justify function is on or off.

SUCCINCT SUMMARIES Document storage and retrieval is efficient and simple. When saving a document, *PFS:Professional Write* permits you to enter a 43-character description of your file, which the program will display on a document-summary screen each time you retrieve files. You can save in four different formats: Normal (*PFS:Professional Write* format), ASCII, DCA (Document Content Architecture), and Encrypted. The Encrypted file format requires you to enter a password when saving the file and to use the same password when retrieving it. The file is encrypted on the disk so that unauthorized users can't view its contents with the DOS TYPE command.

The program protects you from data loss by warning you to save your document when you try to exit from the program or try to load a new document without having previously saved all changes. It also alerts you if you are about to overwrite an existing file and save the document by using another filename that already exists. But unfortunately, *PFS:Professional Write* does not make automatic backups. If you want to save earlier revisions of your document, you must change the name of the file when you save it.

PFS:Professional Write also has an easy-to-use address book. Available from the menu invoked with the F6 key, it allows you to enter or search for names, addresses, phone numbers, and two user-specified comment fields. When the program finds a record, a single keystroke will transfer the contents directly to the working document in a user-defined format. Although each address book is limited to 256 records, you can create just as

many address books as you desire.

You can then use the address books with the mail-merge feature to quickly generate form letters. Like the other features, the mail-merge is easy to learn and use. You can define your own search criteria and generate form letters selectively.

You access the Print menu from the File/Print menu (F2). It allows you to specify ranges of pages to print, numbers of copies, print style, output device (either of two printers or disk), and the data file to merge if you are printing a form letter. Us-



PFS:Professional Write
does a good job
of balancing power with
ease of use.

ing embedded *JOIN* and *GRAPH* commands, you can tell *PFS:Professional Write* to print sections of spreadsheets generated by using *PFS:Report* or *PFS:Professional Plan*—or to print graphs generated by *PFS:Graph*, *PFS:Professional Plan*, or *Harvard Presentation Graphics*—at any point within a document.

Other advanced features of *PFS:Professional Write* include 35 user-definable macros; a dictionary that not only identifies misspelled words and suggests corrections, but also identifies repeated words and irregular capitalization; a synonym finder, and a line-drawing function for creating documents such as an organization chart.

PFS:Professional Write does a good job of balancing power and features with ease of learning and use. Although it lacks many of the features of more-expensive word processors and is limited to a document size of 64K, its complement of features is more than adequate for the vast majority of personal and business communications. *PFS:Professional Write's* short learning curve, coupled with its ease of use and solid features, ensures that it will be popular for years to come.

—Craig Ellison

“



”

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And expandability is just the beginning. The Snap 1+1's ingenious design lets you separate the

main unit from the disk unit. So you can download information into a five-pound diskless PC, and take it straight into your meeting. Or anywhere else.

The full-featured Snap 1+1 operates at 10 MHz. It's fully IBM compatible. And it's expandable up to 1.6M. So choose the laptop with unlimited possibilities: the Snap 1+1 from Datavue. To find out more, contact us at One Meca Way, Norcross, Georgia 30093.

(404) 564-5555.

SPECIAL BONUS: \$199 HALF CARD

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SNAP 1+1™
BY DATAVUE



Name _____

Address _____

City _____ State _____ Zip _____

Phone _____ Computer Serial No. _____

I just bought my new Snap 1+1 computer, and I'd like to take advantage of your \$199 Bonus Half Card offer. Please send me the following half card (check one):

☐ Datavue Fax Board ☐ MainLink II (3270 terminal emulation board)

☐ UltraVGA Graphics Adapter ☐ QuadEGA Pro/Type

Payment by:

☐ Visa ☐ MasterCard ☐ American Express ☐ Certified Check

Credit Card Number _____ Expiration Date _____

Please return this coupon with completed warranty card and credit card information or certified check for \$199 plus \$10 for shipping and handling to: Datavue Bonus Office, One Meca Way, Norcross, GA 30093. Allow 4 to 6 weeks for delivery.

DATAVUE
An Intelligent Systems Company



Working Out Word Processors

Our word processing performance procedures were developed to test as wide a variety of word processing functions as possible without handicapping word processing programs designed for personal and small-business use. Full-featured and powerful word processors perform a number of elegant tasks—from windowing to graphics manipulation—and because of such sophisticated features, our goal was to design tests that allowed simple but powerful packages to compete equally with the most advanced programs. With this in mind, PC Labs developed tests that were tough but fair. Unfortunately, some packages could not perform all of the tests, and where they failed, no results are recorded.

The PC Labs tests begin with an importing task using a 50K document file—an excerpt from *The Autobiography of Benjamin Franklin*—provided to PC Magazine by The Library of America and converted into a pure ASCII format by Kurzweil Scanner Inc. The document was pulled into the editing mode of the word processor being tested. Of the 55 word processors reviewed, 8 programs simply could not import a file of that size. Another program used a non-DOS format and could not read the ASCII file. Accordingly, no results are recorded for the programs that failed this initial task (see the following interpretive caption for details). Failure on this test in no way reflects on a program's ability to handle standard word processing tasks; it merely skewed the results for those programs in such a way as to make their performance times unusable in the plotting of our test results on the following pages.

In developing our suite of tests we chose tasks that duplicate the most common word processing functions. The tasks include document load and save, global search and replace, cursor movement, jumps from top to middle and from middle to end of a document, block move and copy, text merging within a document, text page deletions, and printing.

Within our testing environment we assessed each program's printing abilities via a 1MB RAMdisk to avoid biasing output speed with printing time, different print buffer sizes, and the software's handling of printer drivers and control codes. These factors vary greatly from program to program; therefore, the most effective way to determine output time is to print data to memory.

An EGA board also was installed in the testing system (an 8-MHz IBM PC AT) to show the abilities of some programs to change screen attributes, such as color.

On each word processing test, the program's performance was measured to within a tenth of a second. The reported speeds reflect the time it took from when the last keystroke was entered until control of the keyboard, still in the editing mode, was returned to the tester. Where they significantly affected the time taken to complete the tasks, the number of keystrokes needed to perform the test was noted by the tester. The original test document was used in every test except Text Delete to avoid modifying the file by the sequence in which the tests were done.

WordPerfect was chosen as the standard against which all the word processors reviewed were measured—not because of its performance, but because of its popularity and widespread use. However, its overall results rank within the top five packages of all those tested.

Nine of the 55 word processors reviewed by PC Magazine could not import the initial 50K test document; therefore, no results are shown for *Personal QWERTY*, *Harmony*, *My Word!*, *The Executive Footnote*, *The Executive Secretary*, *Bank Street Writer Plus*, *Cut & Paste*, *MindReader*, and *DisplayWrite Assistant*.

Of the top performers, *Galaxy* had some of the fastest times and passed all the tests save the print test. *EinsteinWriter*, *WordStar 2000 Plus*, *Dec Easy Word II*, and *Microsoft Word* all performed comparably. Interestingly, *WordStar 2000 Plus* tested much better in all categories than its counterpart, *WordStar Professional*. And a look at *Dec Easy* and *Microsoft Word* shows slower times on the block manipulation test due to the number of steps needed to perform the tasks. *EinsteinWriter* failed the merge test and couldn't handle the new file size after adding three pages of text to the original document.

Texta performed well on the tasks it was able to handle, yet it failed the block manipulation, merge, delete, and print tests. The program simply could not manipulate large chunks of data.

At the middle ground of the testing results, *Executive Writer* and *CommandWriter* finished roughly together. Though *Executive Writer* had a better showing than *CommandWriter*, it failed the global search-and-replace test due to its sensitivity to upper- and lowercase letters and string definition. Where time is not a factor, this sensitivity can be an advantage because a case-sensitive search-and-replace function offers more user control over

the replacement. On the other hand, *CommandWriter* could not perform any of the block manipulation test functions.

A comparison of the times for *Microsoft Windows Write*, *Write Now*, and *WordStar Professional* demonstrates that they are not speedy word processors. *Write Now* and *WordStar Professional* managed to chug through all the tests successfully; *Windows Write* was the fastest of the threesome, but it could not perform either the block-and-move or the block-and-copy test directly. Its cut-and-paste option accounts for the difficulty with these tests.

Finally, *Volkswriter Deluxe Plus*, *WPS-PC*, and *Samna Plus IV* were the slowest performers. *Samna Plus IV* and *Volkswriter Deluxe* passed all the tests, but *WPS-PC* could not execute the save-end-resume test—an important time- and data-saving function for a word processor. In addition, it couldn't perform a global search and replace, nor could it perform the block manipulation tests.

The PC Labs word processing tests were performed on an 8-MHz IBM PC AT outfitted with a 30MB hard disk drive, an Intel Above Board (supporting 2MB RAM), and an EGA card. Additionally, a 1MB RAMdisk was created to perform the print test. All programs were run under DOS 3.2 with files and buffers equal to 20.

The tests were done using a 50K document file—approximately 14 pages long and without page numbering. The document contained 8,835 words with 66 lines per page and 72 characters per line. Each program's performance was reported to within a tenth of a second on each of the nine tests. The reported speeds measure the time from when the last keystroke was entered to the moment when control of the keyboard, still in the editing mode, was returned to the tester. For each test except one, the original test document was used as the source document. Reported performance times are the average in seconds of three test trials.

The **Import File Size** test measures in bytes the final imported file size once a program brings a 50K document into its own environment. Programs manipulate files differently—for example, in the way they insert formatting codes into the document—hence the imported file size varies. Software that could not import the 50K file could not be tested. However, the inability to import large files should in no way reflect on a program's performance with smaller documents.

The **Document Manipulation** tests measure the time it takes a word processor to load and save a file. **Document Load** measures the time it takes to call up the file imported in the **Import File Size** test; **Save and Resume** measures the time it takes a program to save the same document and return control of the keyboard to the tester.

The **Global Search and Replace** test measures how long it takes a word processor to replace 115 cases of the word *his* with the word *theirs*. Sensitivity to upper- and lowercase letters was noted in the reporting of each result.

The **Cursor Movement** tests determine how long it takes to move the cursor through a document. The **Cursor Top-to-Middle** test times the jump from the top, or Home position, to a predefined point at the middle of the document. The **Cursor Middle-to-Bottom** test times the jump from the midpoint to the bottom, or End position, of the document.

The **Search for Middle** test measures the time it takes to find a sentence placed in the exact middle of the document. Since some word processors cannot search for an entire sentence, the test allows for searching on a keyword or string of words.

The **Block Manipulation** test is based on two separate timings. The **Block-and-Move** test records the software's ability to define, or highlight, the first three pages of the test document and then move it to the center of the document—somewhat like a cut-and-paste operation. This test moves but does not delete the text. The **Block-and-Copy** test takes the same three-page block and copies it to an external file. Both tests require large-scale page reformatting that slows the performance of some programs, depending on how well they handle the task in a RAM buffer. The larger the buffer, the faster the results.

The **Merge** test times the program's ability to import an external file to a point immediately following the middle of the document file. The external file consists of the first three pages of the original document. Again, page reformatting effects the performance results.

The **Text Delete** test times how long it takes to define and delete the file that the Merge test imported and inserted into the document. Again, this procedure requires significant page reformatting, and the program's buffering capability greatly affects performance.

The **Print Whole Document** test uses a 1MB RAMdisk and times the program's ability to print the entire 50K test document to an external file.

WORD PROCESSORS

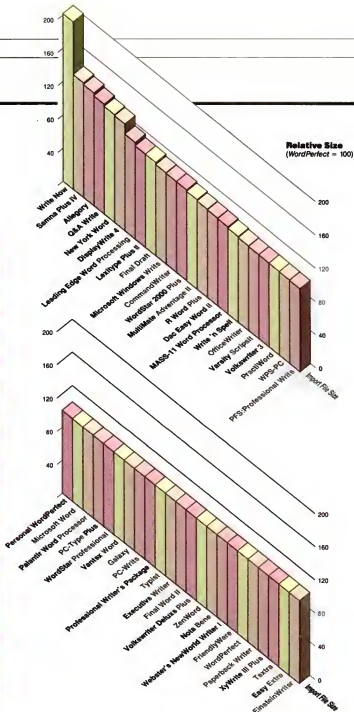


Performance Tests: Word Processors

Performance

| | Import File Size (bytes) |
|-------------------------------|--------------------------|
| Write Now | 100,947 |
| Samna Plus IV | 69,120 |
| Allegory | 68,096 |
| Q&A Write | 66,425 |
| New York Word | 65,111 |
| DisplayWrite 4 | 64,512 |
| Leading Edge Word Processing | 58,368 |
| Lexitype Plus II | 56,320 |
| Final Draft | 56,320 |
| Microsoft Windows Write | 55,040 |
| CommandWriter | 54,784 |
| WordStar 2000 Plus | 54,706 |
| MultiMate Advantage II | 53,760 |
| R Word Plus | 52,900 |
| Dac Easy Word II | 52,556 |
| MASS-IT Word Processor | 52,268 |
| Write 'n Spell | 51,520 |
| OfficeWriter | 50,913 |
| Versity Script | 50,649 |
| Volkswriter 3 | 50,580 |
| PractiWord | 50,544 |
| WPS-PC | 50,444 |
| PFS: Professional Write | 50,322 |
| Personal WordPerfect | 50,225 |
| Microsoft Word | 50,176 |
| Palantir Word Processor | 50,176 |
| PC-Type Plus | 50,048 |
| WordStar Professional | 50,048 |
| Vantex Word | 50,006 |
| Galaxy | 50,003 |
| PC-Write | 50,002 |
| Professional Writer's Package | 50,002 |
| Typist | 50,000 |
| Executive Writer | 50,000 |
| Final Word II | 50,000 |
| Volkswriter Deluxe Plus | 50,000 |
| ZenWord | 50,000 |
| Nota Bene | 50,000 |
| Webster's NewWorld Writer I | 50,000 |
| FriendlyWare | 50,000 |
| WordPerfect | 50,000 |
| Paperback Writer | 50,000 |
| XyWrite III Plus | 50,000 |
| Textura | 50,000 |
| Easy Extra | 49,999 |
| EinsteinWriter | 49,940 |

*N/A—Not applicable; function not available.



Performance Times

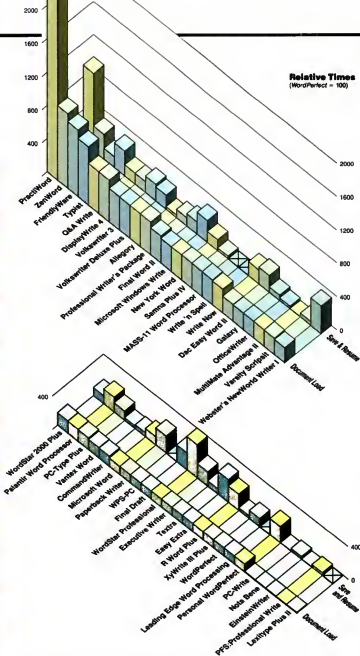
(Times given in seconds)

Document Manipulation

Document Load
Save and Resume

| | Document Load | Save and Resume |
|-------------------------------|---------------|-----------------|
| PractiWord | 30.00 | 28.00 |
| ZenWord | 9.00 | 9.00 |
| FriendlyWare | 8.00 | 4.00 |
| Typist | 7.00 | 9.00 |
| Q&A Write | 5.00 | 4.00 |
| DisplayWrite 4 | 5.00 | 4.00 |
| Volkswriter 3 | 4.00 | 6.00 |
| Volkswriter Deluxe Plus | 4.00 | 5.00 |
| Allegory | 4.00 | 1.00 |
| Professional Writer's Package | 4.00 | 3.00 |
| Final Word II | 3.30 | 4.50 |
| Microsoft Windows Write | 3.00 | 8.00 |
| New York Word | 3.00 | 4.00 |
| Samna Plus IV | 3.00 | 1.00 |
| MASS-11 Word Processor | 3.00 | N/A* |
| Write 'n Spell | 3.00 | N/A* |
| Write Now | 2.90 | 5.06 |
| Dac Easy Word II | 2.05 | 6.03 |
| Galaxy | 2.00 | 2.00 |
| OfficeWriter | 2.00 | 1.00 |
| MultiMate Advantage II | 2.00 | 0.10 |
| Varsity Scripsit | 1.98 | 1.38 |
| Webster's NewWorld Writer | 1.83 | 10.01 |
| WordStar 2000 Plus | 1.50 | 3.00 |
| Palantir Word Processor | 1.47 | 5.41 |
| PC-Type Plus | 1.42 | 3.36 |
| Vantex Word | 1.25 | 1.00 |
| CommandWriter | 1.15 | 1.41 |
| Microsoft Word | 1.00 | 3.00 |
| Paperback Writer | 1.00 | 6.19 |
| WPS-PC | 1.00 | N/A* |
| Final Draft | 1.00 | 6.00 |
| WordStar Professional | 1.00 | 12.00 |
| Executive Writer | 1.00 | 5.22 |
| Textra | 1.00 | 2.00 |
| Easy Extra | 1.00 | 8.30 |
| R Word Plus | 1.00 | 6.00 |
| XyWrite III Plus | 1.00 | 1.00 |
| WordPerfect | 1.00 | 3.00 |
| Leading Edge Word Processing | 1.00 | N/A* |
| Personal WordPerfect | 1.00 | 6.00 |
| PC-Write | 0.10 | 0.10 |
| Nota Bene | 0.10 | 1.00 |
| EinsteinWriter | 0.10 | 0.10 |
| PFS:Professional Write | 0.10 | 1.01 |
| Lexitype Plus II | 0.10 | N/A* |

Relative Times
(WordPerfect = 100)



A lot of computer for your money



Bentley-286/12

Base System

12MHz 80286 processor, 1MB RAM, 1.2MB floppy drive, dual floppy/hard drive controller, 200-watt power supply, keyboard.

- With 40MB HD MiniScribe, 28ms \$1679
- With 70MB HD MiniScribe, 28ms \$1979

\$1129



Bentley-286/10

Base System

10MHz 80286 processor in a compact chassis, Phoenix BIOS, 512KB RAM, 1.2MB floppy drive, dual floppy/hard drive controller, 200-watt power supply, keyboard.

- With 40MB HD MiniScribe, 28ms \$1449
- With 70MB HD MiniScribe, 28ms \$1749

\$899

Bentley Computers ... The Price/Performance Leaders!



Monographics Card

Text mode 80 col x 25 characters, graphics mode 720 x 348, parallel port

\$65



Samsung 12" flat screen with tilt and swivel base

\$95

Mono Combo

Monographics card and monitor

\$139



EGA Card

640 x 350, 256KB display RAM

\$149



EGA Monitor

14" high resolution

\$349

EGA Combo

EGA card and monitor

\$479



Color Card

High resolution color graphics card

\$69



Color Monitor

14" CGA monitor

\$315

Color Combo

CGA card and monitor

\$329



NEC Multisync-The elite monitor. Adjusts to any horizontal frequency between 15.5KHz and 25KHz. Resolution up to 800 x 560, and supports both analog and TTL inputs. Thirteen-inch screen.

Only **\$599**



Modems-All Bentley modems are compatible with all popular communication standards and have auto answer, auto redial, and auto voice/data switching. External modems include LED status indicators and require modem cable for hookup.

300/1200 Baud Internal Modem **\$69**

300/1200/2400 Baud Internal Modem **\$139**

300/1200 Baud External Modem **\$89**

2400 Baud External Modem .. **\$159**

More memory, more power...



MFC-A six-function expansion card: 384KB RAM, serial port, parallel port, game port, clock-calendar with battery backup, and utility software.

Only **\$199**



AT-MFC-for IBM PC AT* Up to 1.5MB memory expansion, serial & parallel port.

Only **\$139**



MEM-576-Memory expansion card that fits in a short slot and supports either 64KB or 256KB chips. Comes with 0KB, expandable to 192KB, 284KB or 576KB.

Only **\$35**



EMS-Expanded-Memory-Specification card compatible with the Lotus/Intel memory specification. Comes with 0KB, expandable to 2MB. Includes utility software.

PC Version Only **\$99**

AT Version Only **\$119**



Memory Chips (Sets of 10)

256K chips (150ns) **\$40**

256K chips (120ns) **\$42**

256K chips (100ns) **\$46**

Coprocessors

8087-3 (5MHz) **\$129**

8087-2 (8MHz) **\$159**

80287-6 (6MHz) **\$219**

80287-8 (8MHz) **\$269**

80287-10 (10MHz) **\$349**

AT I/O-Serial port and parallel port.

Only **\$59**

PC I/O-Serial port, parallel port, game port, and clock-calendar with battery back-up.

Only **\$65**

... plus a one-year warranty!



Bentley-286/8

Base System **\$799**

8MHz 80286 processor in a compact chassis, Phoenix BIOS, 512KB RAM, 1.2MB floppy drive, dual floppy/hard drive controller, 200-watt power supply, keyboard.

- With 20MB HD Seagate, 65ms **\$1095**
- With 40MB HD MiniScribe, 28ms **\$1345**



Bentley Turbo-10

Base System **\$449**

Turbo-charged XT-compatible 8088 processor running at 10MHz, 640KB RAM, one 360KB floppy drive and controller, eight expansion slots, 150-watt power supply, keyboard.

- With 30MB HD MiniScribe, 55ms **\$779**
- With 40MB HD MiniScribe, 61ms **\$839**

Enhance your Bentley-286 with our popular AT add-on products!

MiniScribe Hard Disk Drives

High Quality • High Storage Capacity
High Performance • Low Price



One-Year Warranty

Both drives feature an average access time of 28 milliseconds. The drives' positioning systems use a rugged linear voice coil actuator that eliminates head skew problems. Microprocessor-aided control provides fast, accurate head positioning. Superior head/disk tracking is achieved through the use of Whitney technology head sliders and flexures. With MiniScribe's fail-safe actuator lock, the head positioner is retracted and locked at power-down, eliminating data zone contact. Partitioning software is included so you can take advantage of the full storage capacity.

42MB \$569 70MB \$799



PC Hard Disk Kits-

Quality 30MB and 40MB hard disk kits for the IBM PC and compatibles. Each kit includes a half-height Winchester hard disk, hard disk controller, cables, software, mounting hardware, and complete illustrated installation manual.

- 30MB MiniScribe (55ms) **\$339**
- 40MB MiniScribe (61ms) **\$399**
- 20MB
For the Compaq Portable **\$299**



360KB Diskette Drives-
Convenience and compatibility.

- For PCs **\$99**
- For ATs **\$109**



Internal Tape Backups-Avoid disk swapping:
streaming tape for your IBM PC[®], PC AT[®], or
compatible.

20MB 60MB
For the PC ... **\$389** For the AT ... **\$757**

Bentley

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Amazing prices on quality computers and add-on products. Free UPS ground shipping in the continental U.S.A. Thirty-day, money-back guarantee. No surcharge for MasterCard, VISA, COD, or cashier's check. Fortune 1000, university, and institution purchase orders accepted with approved credit. Phenomenal savings with a one-year warranty. **Sales Hours:** Mon.-Fri. 8 a.m.-9 p.m.
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WORD PROCESSORS



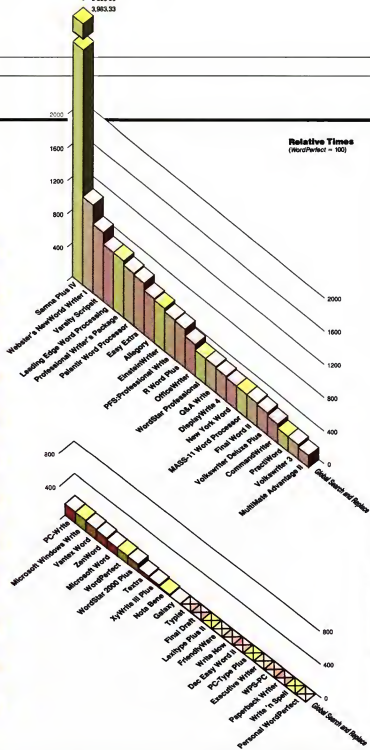
Performance Tests: Word Processors (continued)

Performance Times (Times given in seconds)

| | Global
Search
and
Replace |
|-------------------------------|------------------------------------|
| Samna Plus IV | 239.00 |
| Webster's NewWorld Writer I | 63.13 |
| Varsity Script | 48.40 |
| Landing Edge Word Processing | 41.00 |
| Professional Writer's Package | 41.00 |
| Palantir Word Processor | 36.30 |
| Easy Extra | 37.36 |
| Allegory | 32.00 |
| EinsteinsWriter | 31.00 |
| PFS:Professional Write | 28.62 |
| R Word Plus | 26.00 |
| OfficeWriter | 23.00 |
| WordStar Professional | 19.00 |
| Q&A Write | 19.00 |
| DisplayWrite 4 | 18.00 |
| New York Word | 17.00 |
| MASS-11 Word Processor | 17.00 |
| Final Word II | 16.90 |
| Volkswriter Deluxe Plus | 16.00 |
| CommandWriter | 13.92 |
| PractiWord | 11.00 |
| Volkswriter 3 | 11.00 |
| MultiMate Advantage II | 9.00 |
| PC-Write | 8.27 |
| Microsoft Windows Write | 8.00 |
| Vantex Word | 7.44 |
| ZentWord | 7.00 |
| Microsoft Word | 6.00 |
| WordPerfect | 6.00 |
| WordStar 2000 Plus | 5.70 |
| Textra | 2.70 |
| XyWrite III Plus | 2.00 |
| Nota Bene | 1.00 |
| Galaxy | 0.10 |
| Typist | N/A* |
| Final Draft | N/A* |
| Lazetype Plus II | N/A* |
| FriendlyWare | N/A* |
| Write Now | N/A* |
| Dac Easy Word II | N/A? |
| PC-Type Plus | N/A? |
| Executive Writer | N/A? |
| WPS-PC | N/A? |
| Paperback Writer | N/A? |
| Write 'n Spell | N/A? |
| Personal WordPerfect | N/A? |

*N/A—Not applicable: function not available.

?N/A—Not applicable: word processor failed this test.



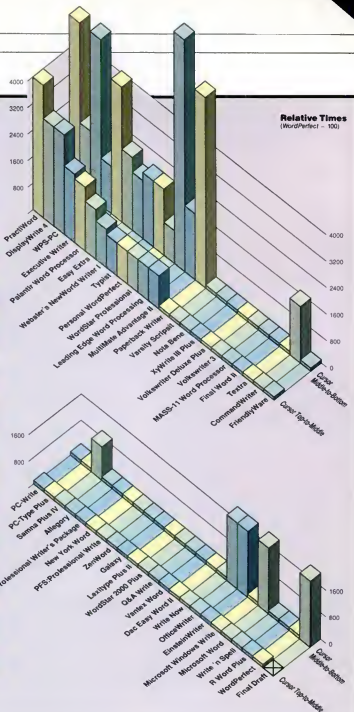
Performance Times

(Times given in seconds)

Cursor Movement

Cursor Top-to-Middle
Cursor Middle-to-Bottom

| | | |
|-------------------------------|------|------|
| PractiWord | 4.00 | 5.00 |
| DisplayWrite 4 | 3.00 | 2.00 |
| WPS-PC | 3.00 | 5.00 |
| Executive Writer | 2.07 | 1.43 |
| Palatir Word Processor | 1.93 | 4.07 |
| Easy Extra | 1.50 | 2.20 |
| Webster's NewWorld Writer I | 1.16 | 1.76 |
| Typist | 1.00 | 2.00 |
| Personal WordPerfect | 1.00 | 2.00 |
| WordStar Professional | 1.00 | 1.00 |
| Leading Edge Word Processing | 1.00 | 7.00 |
| MultiMate Advantage II | 1.00 | 2.00 |
| Paperback Writer | 0.10 | 5.76 |
| Variety Script | 0.10 | 0.10 |
| Nova Bene | 0.10 | 0.10 |
| XyWrite III Plus | 0.10 | 0.10 |
| Volkswriter Deluxe Plus | 0.10 | 0.10 |
| Volkswriter 3 | 0.10 | 0.10 |
| MASS-11 Word Processor | 0.10 | 0.10 |
| Final Word II | 0.10 | 0.10 |
| Textra | 0.10 | 0.10 |
| CommandWriter | 0.10 | 1.74 |
| FriendlyWare | 0.10 | 0.10 |
| PC-Write | 0.10 | 0.10 |
| PC-Type Plus | 0.10 | 0.10 |
| Sanna Plus IV | 0.10 | 1.00 |
| Allegory | 0.10 | 0.10 |
| Professional Writer's Package | 0.10 | 0.10 |
| New York Word | 0.10 | 0.10 |
| PFS Professional Write | 0.10 | 0.10 |
| ZenWord | 0.10 | 0.10 |
| Galaxy | 0.10 | 0.10 |
| Lexatype Plus II | 0.10 | 0.10 |
| WordStar 2000 Plus | 0.10 | 0.10 |
| Q&A Write | 0.10 | 0.10 |
| Vantex Word | 0.10 | 0.10 |
| Dac Easy Word II | 0.10 | 0.10 |
| Write Now | 0.10 | 0.10 |
| OfficeWriter | 0.10 | 2.00 |
| EinsteinWriter | 0.10 | 2.00 |
| Microsoft Windows Write | 0.10 | 0.10 |
| Microsoft Word | 0.10 | 2.00 |
| Write 'n Spell | 0.10 | 0.10 |
| R Word Plus | 0.10 | 0.10 |
| WordPerfect | 0.10 | 0.10 |
| Final Draft | N/A* | 2.00 |



WORD PROCESSORS

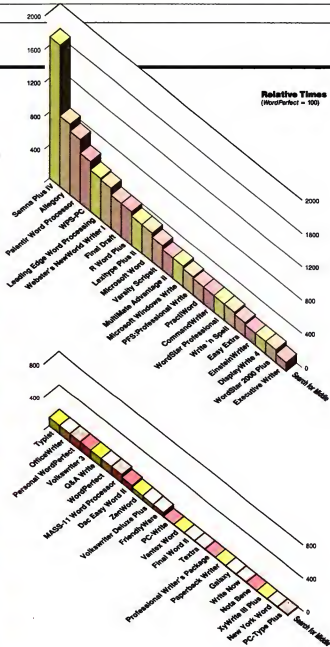


Performance Tests: Word Processors (continued)

Performance Times (Times given in seconds)

| | Search
for
Middle |
|-------------------------------|-------------------------|
| Samna Plus IV | 34.00 |
| Alegory | 17.00 |
| Palantir Word Processor | 15.29 |
| WPS-PC | 12.00 |
| Leading Edge Word Processing | 10.00 |
| Webster's NewWorld Writer I | 9.65 |
| Final Draft | 8.00 |
| R Word Plus | 8.00 |
| Lextype Plus II | 7.00 |
| Microsoft Word | 7.00 |
| Variety Script | 5.98 |
| MultiMate Advantage II | 5.00 |
| Microsoft Windows Write | 5.00 |
| PFS Professional Write | 4.38 |
| PractiWord | 4.00 |
| CommandWriter | 4.00 |
| WordStar Professional | 4.00 |
| Write 'n' Spell | 4.00 |
| Easy Extra | 3.50 |
| EinsteinWriter | 3.00 |
| DisplayWrite 4 | 3.00 |
| WordStar 2000 Plus | 3.00 |
| Executive Writer | 2.08 |
| Typist | 2.00 |
| OfficeWriter | 2.00 |
| Personal WordPerfect | 2.00 |
| Volkswriter 3 | 2.00 |
| Q&A Write | 2.00 |
| WordPerfect | 2.00 |
| MASS-11 Word Processor | 2.00 |
| Dac Easy Word II | 1.35 |
| ZenWord | 1.00 |
| Volkswriter Deluxe Plus | 1.00 |
| FriendlyWare | 1.00 |
| PC-Write | 0.10 |
| Vantex Word | 0.10 |
| Final Word II | 0.10 |
| Textra | 0.10 |
| Professional Writer's Package | 0.10 |
| Paperback Writer | 0.10 |
| Galaxy | 0.10 |
| Write Now | 0.10 |
| Nota Bene | 0.10 |
| XyWrite III Plus | 0.10 |
| New York Word | 0.10 |
| PC-Type Plus | 0.10 |

*N/A—Not applicable; function not available.
*N/A—Not applicable; word processor failed this test.



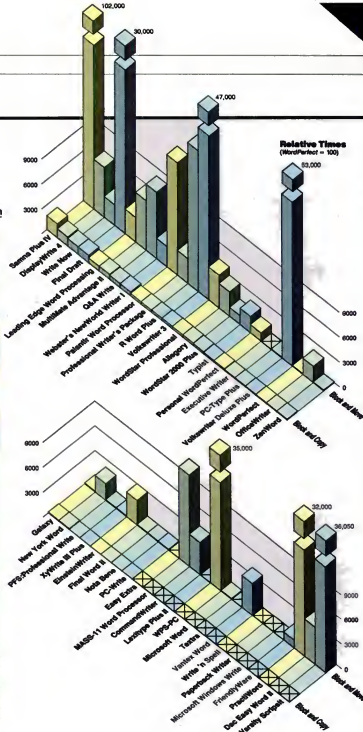
Performance Times

(Times given in seconds)

Block Manipulation

Block and Move Block and Copy

| | | |
|-------------------------------|------------------|------------------|
| Sanna Plus IV | 102.00 | 17.00 |
| DisplayWrite 4 | 6.00 | 11.00 |
| Write Now | 2.95 | 9.93 |
| Final Draft | 30.00 | 9.00 |
| Leading Edge Word Processing | 3.00 | 6.00 |
| Multimate Advantage II | 6.00 | 6.00 |
| Q&A Write | 8.00 | 5.00 |
| Webster's NewWorld Writer I | 2.47 | 4.82 |
| Palantir Word Processor | 13.56 | 3.01 |
| Professional Writer's Package | 3.00 | 3.00 |
| R Word Plus | 17.00 | 3.00 |
| Volkswriter 3 | 47.00 | 3.00 |
| WordStar Professional | 4.00 | 3.00 |
| Allegory | 3.00 | 3.00 |
| WordStar 2000 Plus | 1.10 | 2.90 |
| Typist | 2.00 | 2.00 |
| Personal WordPerfect | 1.00 | 2.00 |
| Executive Writer | N/A ¹ | 1.25 |
| PC-Type Plus | 0.10 | 1.21 |
| Volkswriter Deluxe Plus | 53.00 | 1.00 |
| WordPerfect | 0.10 | 1.00 |
| OfficeWriter | 2.00 | 1.00 |
| ZenWord | 1.00 | 1.00 |
| Galaxy | 0.10 | 1.00 |
| New York Word | 2.00 | 1.00 |
| PFS:Professional Write | 0.10 | 0.10 |
| XyWrite III Plus | 0.10 | 0.10 |
| EinsteinWriter | 3.00 | 0.10 |
| Final Word II | 0.10 | 0.10 |
| Nota Bene | 0.10 | 0.10 |
| PC-Write | 0.10 | 0.10 |
| Easy Extra | N/A ² | N/A ² |
| MASS-11 Word Processor | 11.00 | N/A ¹ |
| CommandWriter | 3.93 | N/A ¹ |
| Lexatype Plus II | N/A ¹ | N/A ¹ |
| WPS-PC | 36.00 | N/A ¹ |
| Microsoft Word | 0.10 | N/A ¹ |
| Textre | N/A ¹ | N/A ¹ |
| Vortex Word | 3.90 | N/A ¹ |
| Write 'n Spell | N/A ¹ | N/A ¹ |
| Paperback Writer | N/A ¹ | N/A ¹ |
| Microsoft Windows Write | N/A ¹ | N/A ¹ |
| FriendlyWare | 1.00 | N/A ¹ |
| PractiWord | 32.00 | N/A ¹ |
| Dac Easy Word II | 4.54 | N/A ¹ |
| Varsity Scripsit | 36.05 | N/A ¹ |



WORD PROCESSORS

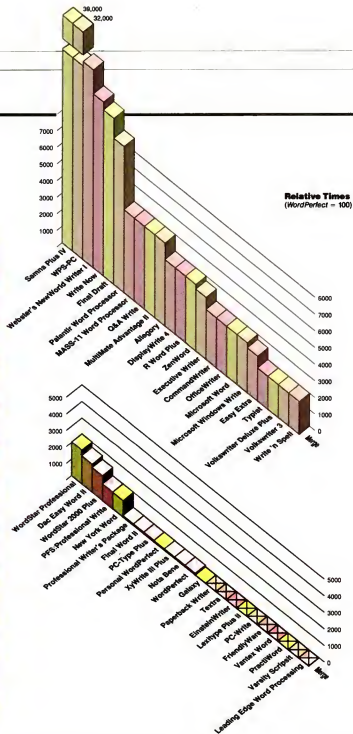


Performance Tests: Word Processors (continued)

Performance Times (Times given in seconds)

| | Merge |
|-------------------------------|-------|
| Sanna Plus IV | 39.00 |
| WPS-PC | 32.00 |
| Webster's NewWorld Writer I | 11.91 |
| Write Now | 10.47 |
| Final Draft | 10.00 |
| Palantir Word Processor | 8.79 |
| MASS-11 Word Processor | 5.00 |
| Q&A Write | 5.00 |
| Multimate Advantage II | 5.00 |
| Allegory | 5.00 |
| DisplayWrite 4 | 4.00 |
| R Word Plus | 4.00 |
| ZenWord | 4.00 |
| Executive Writer | 3.72 |
| CommandWriter | 3.00 |
| OfficeWriter | 3.00 |
| Microsoft Word | 3.00 |
| Microsoft Windows Write | 3.00 |
| Easy Extra | 2.70 |
| Typist | 2.00 |
| VolksWriter Deluxe Plus | 2.00 |
| VolksWriter 3 | 2.00 |
| Write 'n Spell | 2.00 |
| WordStar Professional | 2.00 |
| Dac Easy Word II | 1.73 |
| WordStar 2000 Plus | 1.70 |
| PFS:Professional Write | 1.49 |
| New York Word | 1.00 |
| Professional Writer's Package | 1.00 |
| Final Word II | 0.10 |
| PC-Type Plus | 0.10 |
| Personal WordPerfect | 0.10 |
| XyWrite III Plus | 0.10 |
| Nota Bene | 0.10 |
| WordPerfect | 0.10 |
| Galaxy | 0.10 |
| Paperback Writer | N/A* |
| Textra | N/A* |
| EinsteinWriter | N/A* |
| Leatype Plus II | N/A* |
| PC-Write | N/A* |
| FriendlyWare | N/A* |
| Vantex Word | N/A* |
| PractiWord | N/A* |
| Varsity Script | N/A* |
| Leading Edge Word Processing | N/A* |

*N/A—Not applicable; function not available.
*N/A—Not applicable; word processor failed this test.



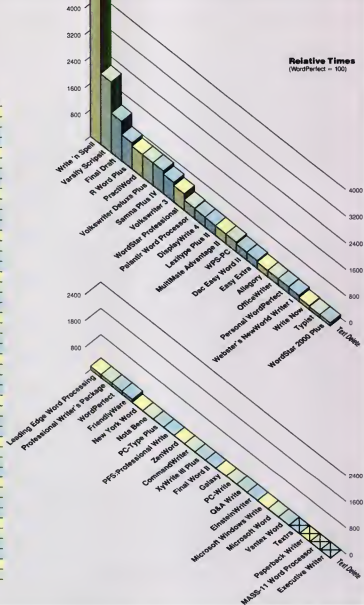
Performance Times

(Times given in seconds)

| | Test
Results |
|-------------------------------|-----------------|
| Write 'n Spell | 78.00 |
| Verity Scriptit | 21.41 |
| Final Draft | 12.00 |
| R Word Plus | 8.00 |
| PractiWord | 7.00 |
| Volkswriter Deluxe Plus | 7.00 |
| Sama Plus IV | 7.00 |
| Volkswriter 3 | 6.00 |
| WordStar Professional | 5.00 |
| Palantir Word Processor | 3.18 |
| DisplayWrite 4 | 3.00 |
| Lexitype Plus II | 3.00 |
| MultiMate Advantage II | 3.00 |
| WPS-PC | 3.00 |
| Dac Easy Word II | 2.49 |
| Easy Extra | 2.40 |
| Allegory | 2.00 |
| OfficeWriter | 2.00 |
| Personal WordPerfect | 2.00 |
| Webster's NewWorld Writer I | 1.87 |
| Write Now | 1.29 |
| Typist | 1.00 |
| WordStar 2000 Plus | 1.00 |
| Leading Edge Word Processing | 1.00 |
| Professional Writer's Package | 1.00 |
| WordPerfect | 1.00 |
| FriendlyWare | 1.00 |
| New York Word | 0.10 |
| Nota Bene | 0.10 |
| PC-Type Plus | 0.10 |
| PFS Professional Write | 0.10 |
| ZenWord | 0.10 |
| CommandWriter | 0.10 |
| XyWrite III Plus | 0.10 |
| Final Word II | 0.10 |
| Galaxy | 0.10 |
| PC-Write | 0.10 |
| Q&A Write | 0.10 |
| EinsteinWriter | 0.10 |
| Microsoft Windows Write | 0.10 |
| Microsoft Word | 0.10 |
| Vantex Word | 0.10 |
| Textra | N/A* |
| Paperback Writer | N/A* |
| MASS-11 Word Processor | N/A* |
| Executive Writer | N/A* |

Relative Times

(WordPerfect = 100)



WORD PROCESSORS



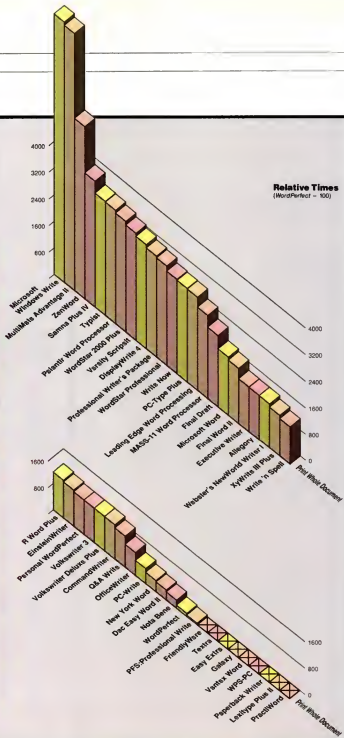
Performance Tests: Word Processors (ends)

Performance Times (Times given in seconds)

| | Print
Whole
Document |
|-------------------------------|----------------------------|
| Microsoft Windows Write | 157.00 |
| MultiMate Advantage II | 155.00 |
| ZenWord | 104.00 |
| Samna Plus IV | 76.00 |
| Typist | 69.00 |
| Palatini Word Processor | 68.66 |
| WordStar 2000 Plus | 67.00 |
| Varsity Script | 64.81 |
| DisplayWrite 4 | 63.00 |
| Professional Writer's Package | 61.00 |
| WordStar Professional | 60.00 |
| Write Now | 56.91 |
| PC-Type Plus | 56.30 |
| Leading Edge Word Processing | 56.00 |
| MASS-11 Word Processor | 50.00 |
| Final Draft | 43.00 |
| Microsoft Word | 35.00 |
| Final Word II | 33.30 |
| Executive Writer | 27.14 |
| Allegory | 27.00 |
| Webster's NewWorld Writer I | 26.96 |
| XyWrite III Plus | 25.00 |
| Write 'n Spell | 23.00 |
| R Word Plus | 23.00 |
| EinsteinWriter | 22.00 |
| Personal WordPerfect | 21.00 |
| VolksWriter 3 | 21.00 |
| VolksWriter Deluxe Plus | 21.00 |
| CommandWriter | 20.00 |
| Q&A Write | 19.00 |
| OfficeWriter | 14.00 |
| PC-Write | 9.26 |
| New York Word | 7.00 |
| Dac Easy Word II | 6.16 |
| Nota Bene | 5.00 |
| WordPerfect | 2.00 |
| PTS-Professional Write | 1.07 |
| FriendlyWare | N/A* |
| Textra | N/A* |
| Easy Extra | N/A* |
| Galaxy | N/A† |
| Vantex Word | N/A† |
| WPS-PC | N/A† |
| Paperback Writer | N/A† |
| Lexitype Plus II | N/A† |
| PractiWord | N/A† |

*N/A—Not applicable: function not available

†N/A—Not applicable: word processor will not print to disk



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wasting time trying to find files,
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WORD PROCESSORS

PractiWord

SUITABILITY TO TASK

Professional

Corporate

Personal

Legal

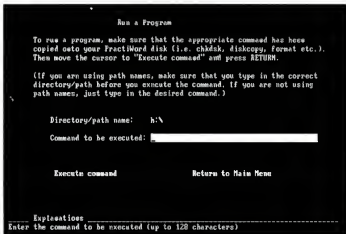
Desktop Publishing



Practicorp's *PractiWord* is a moderately flexible, \$99.95 package best suited for personal word processing. Originally it was designed for the PCjr market, so it's not surprising that the program hasn't kept pace with the rest of the industry.

At the main menu you're offered the choice of creating or editing a document, defining boilerplate files (files containing standard text that will be used frequently in documents), and using such tools as the print and merge functions, options (to change the default settings), Utility (which includes some standard DOS commands), and the Program (which executes DOS commands). The menu screen also displays the current drive/path, which you can change.

The system defaults to a file called Notepad, but you can select a different file by either typing in the name or using the Document option to get a list of the files in



PractiWord's Program utility allows you to run single-line DOS commands without exiting the software.

the current directory. You can select files from this list by moving the cursor to the correct file and pressing Enter.

PractiWord gives you the choice of using either a combination of the Shift, Alt, and function keys or *WordStar*-type Ctrl commands. If you're unfamiliar with *WordStar*, *PractiWord* could take time to learn. The function-key combinations make things a little easier, but a keyboard template would be a big help. Dot commands control formatting, as well as creating indexes and tables of contents. You'll probably want to keep the command summary card on hand at all times.

Text entry is fairly standard. *PractiWord* has several block commands including copy, delete, and move; it can also write a block to a separate file and read a separate file into the document. You can create abbreviations and recall complete words simply by typing the previously defined abbreviations and pressing the Spacebar or Enter. A macro feature is available, but most users will find the abbreviations function adequate for their needs.

Editing existing text can be somewhat tedious: even if you use the word-wrap function, you must reformat the right margin manually when you insert text into an existing line. And you must check page

PractiWord will automatically remind you to save a document at timed intervals.

breaks, since the program offers no automatic adjustment.

You can center text as well as underline or boldface it. And you can set or change margins anywhere in the document, assigning them values from 1 to 199. Tabs set—using the Tab/Margin menu—at evenly spaced intervals (for example, every five spaces) or at unevenly spaced intervals (in which case you must change the Tabracks manually).

Format instructions, entered as dot commands, are available for use to force page breaks, define top and bottom margins, insert header and footer text, and to perform various other page-formatting functions anywhere in the text. The dot commands do not appear in the text but are shown on the command line at the bottom of the screen as being dot commands, and therefore do not take up document space.



FACT FILE



PractiWord,
Version 1.09
Practicorp International
P.O. Box 308
Newton Upper Falls,
MA 02161
(617) 965-9870
List Price: \$99.95

Requires: 256K RAM, one disk drive, DOS 2.0 or later.

In Short: Good for personal use, with boilerplates and abbreviations that allow for fast text entry. Designed, however, for the PCjr, and not on par with the rest of the industry. Not copy protected.

Circle 655 on Reader's Service Card

BRINGS YOU BOILERPLATE The program's boilerplate function is quite useful. You can save text and load it into one of 16 spaces in the boilerplate menu. When you enter the dot command BP followed by the boilerplate filename into the text, the contents of the file appear.

PractiWord includes a merge-print function that is handy for creating form letters. Preparing the files to be merged is fairly simple; again, you use dot commands to identify fields to be merged. The actual merge takes place during printing.

The program can generate an index and table-of-contents, done by using the dot commands. The index command creates an alphabetical index that prints at the end of the document. A table of contents prints at the end of the document once you've marked headings and/or subheadings numerically and issued the appropriate command.

PractiWord will automatically remind you to save a document at timed intervals. The Save menu offers several options, including save and resume editing, save and exit to the main menu, save and exit to DOS, name the document (other than Notepad or other filename selected), and simply abandon the file. If the filename selected already exists, *PractiWord* automatically overwrites it but does create a backup file.

Printing is an option under the Text feature on the main menu. You can select the number of copies desired and the starting and the ending page. For other print choices you use dot commands within the text, or in the options section of the main menu to change the system defaults.

With the valuable Program option you can run single-line DOS commands without exiting to the operating system. You'll probably use the Utility option, though, to choose basic DOS commands like DELETE, RENAME, and COPY from the menu. The FORMAT command is missing from the Utility section, but you can execute it from the Program section.

Technical support is available but we found it hard to reach (we called daily for three days before the tech support rep returned our call). If receiving prompt support is an important issue or if you're unfamiliar or unhappy with *WordStar*, you may want to look elsewhere. But if you've

used and liked *WordStar*, you may find *PractiWord* perfectly adequate for your personal use, but certainly not competitive with the latest products reviewed in this issue. —Tamara Johnson

Professional Writer's Package

SUITABILITY TO TASK

Professional

Corporate

Personal

Legal

Desktop Publishing



The *Professional Writer's Package*, Version 1.10, was released by Emerging Technology Consultants in April 1987 and sells for \$490.

The real price you pay for this power, however, is the steep learning curve you encounter when using it. Don't expect a secretary familiar with *WordStar* to be able to pick this program up and run with it. It's not for generating memos. Using this package for typical office word processing tasks would be like using a VAX CAD/CAM workstation to play Pac Man. Sure, it can be done, but there are easier and cheaper alternatives. *Professional Writer's Package* is really for programmers who need a good text editor for their development work.

The *Professional Writer's Package* consists of four independent modules—Edix, Wordix, Spellix, and Index—that can be linked by a fifth product, PWP Shell, a menu-driven umbrella for the other four.

EDITING COMPONENTS Edix is a text editor, not a word processor. It creates pure ASCII files, which suggests that the authors of this program had software development in mind. And indeed, it is a software developer's dream. You can even choose whether to conclude each file automatically with an end-of-file marker. Sev-

eral other features will also appeal to programmers, such as the capabilities of splitting the screen into as many as four windows and of working with up to 12 files at one time. An interface with DOS will allow you to use one window to execute system commands and then resume editing. Data resulting from the execution of a program running in one buffer can be captured and then moved into another buffer.

Also useful for programming are PWP's search-and-replace capabilities. Not only can you use wildcards such as * and %, but more-sophisticated metacharacters are also available—such as \$, which is similar to % but restricts the match to the end of the line. You can use sets in a search pattern—for instance, [1-9] will find strings containing any number between one and nine. The set [0-9] locates any character that is not a digit. Add to this the program's macro capability, and you have almost unlimited functionality.

If you are a programmer, you will find a lot of helpful features. If you do not need to keep the format functions separate from the actual text, however, a less cumbersome package would probably be a better choice.

Formatting text with the *Professional Writer's Package* is done through the Wordix component, which closely resembles RUNOFF in the DEC environment. By inserting Wordix commands into an Edix document, you can format it any way



FACT FILE



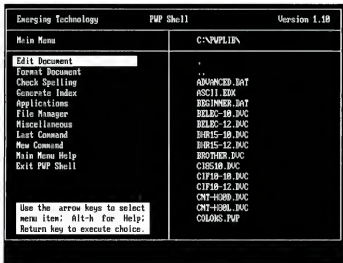
Professional Writer's Package, Version 1.10
Emerging Technology Consultants Inc.
4760 Walnut St.
Boulder, CO 80301
(800) 782-4896
List Price: \$490

Requires: 512K RAM, two disk drives, DOS 2.0 or later.

In Short: Comes with four separate modules, each with distinct editing and formatting features. Can be used as a word processor but is really designed for programmers. Not copy protected.

Circle 100 on Reader Service Card

■ WORD PROCESSORS



Professional Writer's Package includes a shell that lets you use a menu-driven interface. Direct commands are also allowed.

you wish. For example, putting the command 'bw. 75' at the top of the page sets the body width to 75 characters. Using similar commands, you can generate automatic page headers or footers, multi-column page layouts, tables of contents, and other document enhancements. It is not a WYSIWYG program, but it can handle the formatting requirements of large, complicated documents.

OTHER COMPONENTS Spellix is the spelling checker. It performs the usual checking functions: suggesting corrections and allowing you to ignore words, add words to the dictionary, or drop into edit mode. One interesting feature is the throttle. By pressing the Plus or Minus key, you can adjust the speed at which Spellix goes through a document. While finding a way to slow down the spelling checker has never been one of my priorities, the manual explains that you may want to retard the process in order to scan the document as Spellix processes it. Yet when tested on an 8-MHz AT, even in the slowest mode the document went by faster than my tired eyes could follow. Most likely you will keep the pedal to the floor during this

phase and save the scanning process for Edix.

Indix will generate an index for you, finding all the page references, sorting the entries alphabetically, and creating a multiple-column listing. The indexes in the manual were created by Indix. You can use either an Include list to tell Indix which words you wish to include, or an Exclude list to tell Indix which words to omit. It will also work with phrases and concepts.

Learning the *Professional Writer's Package* is made easier by the clearly laid out and well-written documentation. Tutorials for each of the programs take you through the basic functions, and the on-line assistance is very useful. There's also a helpful quick reference guide for Edix. Installation is a simple 10-minute task.

For software developers, the *Professional Writer's Package* would be a super tool for both code and source development. Using macros, you can create a test shell, compiling programs within Edix, capturing error messages, and highlighting the appropriate lines of code. Wordix will give you the ability to format the system and user documentation in a uniform manner and update them easily.

If you are considering the *Professional Writer's Package* as a tool in a business setting, then carefully examine your needs vis-à-vis the features that this package offers. If the program makes sense for you and you wish to use it in a large department, then you will probably have to train everyone on it and use it as your standard text processor.

Professional Writer's Package won't work well in a mixed word-processor environment even though the ASCII files it generates can be imported by other word processors, since any Wordix commands will also be imported and will have to be removed. Of course, Edix macros could remove Wordix commands for you prior to importing the files, but this would get messy.—Kate Emery

Q&A Write

SUITABILITY TO TASK

Professional
Corporate
Personal
Legal
Desktop Publishing



Q: What's easy to use, exceptionally fast, and packed full of super features?

A: Q&A Write, Symantec's \$199 impressive word processor for professional and personal use.

Q&A Write is an enhanced, standalone version of the word processor found in the high-quality integrated file-manager and word-processor package called simply *Q&A* (reviewed in *PC Magazine*, January 27, 1987). Version 1.0/10 of *Q&A Write* does more than its competitors and, for the most part, does it faster. After testing the program, our main question was, how did it get so good?

The answer is that *Q&A Write's* developers took the best of what the other professional and personal, mid-price-range word processors had to offer—uncluttered screens, pull-down menus, on-screen

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DesignCAD 3-D provides features such as Shading, Hidden Line Removal, Printer and Plotter support, and extensive file transfer capability, all for \$299! No other 3-Dimensional CAD system can come close to providing the price/performance of DesignCAD 3-D.

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DesignCAD 3-D is compatible. Compatible with almost any printer, plotter, digitizer, graphics adapter, or mouse. With DesignCAD 3-D, you get file transfer utilities to exchange drawing with nearly any other CAD system. These features are included at no extra charge, of course.

However, the best reason to buy DesignCAD 3-D is not the low price. It's not the outstanding performance. It's not the extensive hardware compatibility. The best reason to buy DesignCAD 3-D is for its amazing ease of use!

DesignCAD 3-D provides powerful commands you can use to produce professional 3-Dimensional drawings in less time than you thought possible! DesignCAD 3-D commands can be selected from the menu or entered as fast, single keystroke commands. We have found DesignCAD 3-D to be easier to learn and easier to use than any 3-Dimensional CAD system for the IBM PC, at any price!

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& 20 mg 1725 | Color System add \$150 w/20mb
add \$279 , w/30 mb add \$299 |
| Model 50 2695 | CLUB AT |
| Model 60 - 40/70 3795/ | 10 mhz, 1.2 floppy, 1 mb Ram memory,
hi res, monographics, monochrome
monitor, clock/calendar \$1195 |
| 4395 | Color system add \$150 |
| Model 80 - 40/70 5250/ | w/30 mb add \$450 , w/40
mb add \$399 |
| 6175 | |
| IBM AT 339 3695 | LAPTOPS |
| COMPAQ | NEC Multispeed \$1410 |
| 386 Desk Pro 40/60/130
\$4599/5575/6950 | NEC Multispeed EL 1625 |
| 286 Desk Pro
12 mhz 2150 | Toshiba 1000 810 |
| Compaq II Model
IV 2879 | Toshiba 1200 2395 |
| Compaq Port. 386
Model 40/100
5999/7399 | Toshiba 3100 3169 |
| Compaq III
20mb/40mb 3695/ | Zenith 2 Drive 1695 |
| 4195 | Zenith w/10 mg 2695 |
| | AT&T SYSTEMS |
| | 6300 |
| | 2 Drive System \$1225 |
| | 20 mb System 1450 |
| | 30 mb System 1475 |
| | Upgrade to 640K 50 |
| | Systems include Keyboard, Bit
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Calendar. |
| | AT&T Color Monitor 675 |

| GRAPHICS CARDS | |
|---|----------------|
| ATI VGA | \$269 |
| EVEREX MICRO ENHANCED | 135 |
| EVEREX THE EDGE | 189 |
| GENOA SUPER EGA/SUPER
EGA HI RES | 189/235 |
| GENOA SPECTRUM | 139 |
| HERCULES GRAPHICS | 181 |
| HERCULES IN COLOR | 289 |
| ORCHID TURBO EGA | 459 |
| PARADISE Auto Switch 480 | 159 |
| QUADRAM EGA PLUS | 169 |
| QUAD PRO SYNC | 209 |
| SIGMA COLOR 400 | 299 |
| NEC GB-1 Multisync | 199 |
| STB CHAUFFEUR HT | 169 |
| STB Multi Res. 480x640 | 259 |
| VEGA DELUXE | 239 |

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|------------------------------------|----------------|
| AST Advantage w/128K | \$239 |
| AST Advantage Premium w/512K | 449 |
| AST 6 PACK PLUS w/384K | 164 |
| AST 6 PACK PREMIUM w/256K | 199 |
| AST 5251-11 PLUS Enhanced | 599 |
| AST RAMPAGE 286 | 320 |
| AST HOTSHOT | 339 |
| EVEREX MAGIC CARD II w/384K | 175 |
| EVEREX MINI MAGIC w/o K | 59 |
| FAST 88/V20 w/Switch | 89 |
| INTEL Above 286 w/512K | 319 |
| INTEL Above PS286 w/512K | 349 |
| INTEL Inboard 386 w/Adapter | 1290 |
| IRMA BOARD II | 699 |
| J RAM III for PC w/o K | 169 |
| J RAM III for AT w/o K | 229 |
| J LASER PLUS PC/AT | 489/589 |
| ORCHID JET 386 w/adapter | 979 |
| ORCHID PC Net Starter Kit | 735 |
| ORCHID Tiny Turbo 286 | 269 |
| ORCHID Ramquest 50/60 w/2mb | 659 |
| ORCHID Twin Turbo | 389 |

| MICE & MISC | |
|---|-------------|
| GENIUS MOUSE w/Dr. Halo | \$63 |
| MICROSOFT MOUSE
w/PC paint brush | 119 |
| MOUSESYSTEMS MOUSE | 105 |
| LOGITECH MOUSE C7 Plus | 74 |
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| Migent Pocket Modem | 169 |
| US Robotics 2400 direct internal | 169 |
| Ventel Half Card 1200 w/Crosstalk | 259 |
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| Ventel 2400 Plus | 359 |

MONITORS

AMDEK

| | |
|------------|-------|
| 410 | \$145 |
| Color 722 | 435 |
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|-----------|-----|
| MAX12 | 149 |
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| Ultrasync | 499 |

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| | |
|--------------------|-------|
| Mono 850 | \$199 |
| Color Display 8512 | 449 |
| Color Display 8513 | 515 |
| Color 8514 | 1150 |
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| | |
|----------------------------|-------|
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| DBXL | 89 |
| Enable 2.0 w/Perspective | 379 |
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| Foxbase + | 199 |
| Freelance Plus | 329 |
| Framework II | 309 |
| IBM Display Write IV | 289 |
| Lotus | 309 |
| Lotus Hal | 109 |
| Managing Your Money 3.0 | 125 |
| Microsoft Word 4.0 | 229 |
| Microsoft Excel | 329 |
| Microsoft Works | 129 |
| Multimate Advantage II | 269 |
| Multiplan | 119 |
| Office Publisher | 589 |
| Office Writer 5.0 | 259 |
| Paradox | 399 |
| PFS Prof Write | 119 |
| PFS Prof File | 145 |
| PFS 1st Choice | 89 |
| R Base System V 1.1 | 419 |
| Revelation | 575 |
| Super Calc IV 1.0 | 269 |
| Symphony 1.2 | 439 |
| Ventura Desktop Publishing | 499 |
| Volkswriter III | 149 |
| Word Perfect 4.2 | 199 |
| Wordstar 2000 + 3.0 | 199 |
| Wordstar Pro 4.0 | 209 |

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| | |
|-----------------------------|-------|
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| external | 635 |
| Genoa Galaxy 60 mb Internal | 799 |
| external | 929 |
| Achives 40 mb internal | 359 |
| Sysgen Quic 60 internal | 895 |
| external | 949 |
| Sysgen 20 mb internal | 575 |
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WORD PROCESSORS

| Field Names | Values | Search Spec | Sort |
|-------------|---------------------------|--------------|------|
| Last Name | Franklin | | |
| First Name | Benjamin | | |
| Title | delegate | | |
| Position | author/statesman | author | |
| Company | U.S. Continental Congress | | |
| Address | G.P.O. | | |
| City | Philadelphia | Philadelphia | |
| State | Pennsylvania | | |
| Zip | none | | |
| Work Phone | none | | |
| Home Phone | none | | |
| Comment | also inventor | | |

Card 1 of 1 Total Cards 1 Page 1 of 1

Q&A Write's Card File keeps track of your lists of names and addresses and enables you to merge the information in form letters and other documents. You can quickly import ASCII files from other database programs or create your own information cards directly.

help—and added what they identified as being missing: full functionality. We tested Version 1.0 of the young but powerful *Q&A Write*; shortly thereafter (and less than a year after introducing the program in 1987), Symantec began shipping Version 1.10, not a full upgrade but free on request to registered users. The modifications, for the most part minor, include a jazzier-looking main menu and screen, a slightly different menu structure, and—more significantly—a new spelling checker. This spell-checking program, developed by Microlytics, is faster and more capable than that of Version 1.0.

Q&A Write's user interface resembles that of its competitor, *PFS:Professional Write*, much the way that word processors for the Macintosh share the same interface. But the underlying program structures of the two programs are quite different—and *Q&A Write's* speed, power, and features are unquestionably superior.

Unquestionably? Skeptics will certainly put aside their reservations when they see *Q&A Write's* capabilities. The features of the program speak for themselves: font and laser printer support, PostScript sup-

port, access to *Lotus 1-2-3* from the main menu, flexible handling of files from other programs, stripping of ASCII carriage returns, built-in spelling checker, card file with up to 1,000 entries, column and row math functions, advanced search and replace, multicolumn printing, powerful mail-merge, user-definable global options, line drawing, network support, text enhancements such as strikeout, DOS functions, keyboard macros, and more.


PRACTICAL TOOL Busy executives will prize *Q&A Write's* practicality. Instead of a deck of floppy disks, you get the main program and the dictionary on two 5¼-inch disks or one 3½-inch disk. Instead of a heavy, lengthy binder filled with tedious documentation, you get an easy-to-use, spiral-bound paperback manual, along with a function key template and a separate quick-start guide, a fonts and laser printer guide, and PostScript guides.

Our only criticism of the reference manual is its peculiar page-numbering system; rather than its awkward letter/number combinations used, simply numbering the pages sequentially would make the index a



EDITOR'S CHOICE

FACT FILE



Q&A Write, Version 1.0
Symantec Corp.
10201 Torre Ave.
Cupertino, CA 95014
(408) 253-9600
List Price: \$199
Requires 384K RAM
(512K recommended),
two disk drives, DOS 2.0 or later (DOS 3.3 for PS/2).

In Short: This easy-to-use, exceptionally fast, full-featured program is an enhanced, standalone version of the word processor in *Q&A*, a high-quality integrated file manager and word processor. It does more than its competitors, and for the same price. It does it faster. Not copy protected.

CIRCLE 680 ON READER SERVICE CARD

more useful and accessible tool.

The main menu, its graphics style jazzed up a bit in Version 1.10 but still simple and clear, looks somewhat like the stylish, well-designed *PFS:Professional Write* main menu. To choose one of the eight options, you can use any of three methods: type the letter for the selection and press Enter, use the Spacebar or the arrow keys to highlight your selection and press Enter, or (as a shortcut for advanced users) simply type the number of the menu item (1 to 8, not shown on-screen).

Pressing F1 at most menus brings up a help screen describing the choices. Function keys, used alone and in combination with the Shift, Ctrl, and Alt keys, tell *Q&A Write* what you want to do. A line across the bottom of the type/edit screen displays the current function-key assignments and the current role of the Esc key.

The type/edit screen, which is again similar to that of *PFS:Professional Write*, mimics the look of a sheet of paper. It also displays up to three lines at the bottom. A rule line indicates the margins, tab stops, and column positions. A status line gives the document name, the percentage of available memory the document is using, the line and page of the cursor position, special features like italics being used, and the document length in pages. Even time to time a message line keeps you posted about what's going on.

Increased productivity is one of *Q&A*

Case History #60102

"With the addition of PC EXPO in Chicago, NETWORLD, MMA Meeting & Show, National FinCom and National CASEcon, our data processing needs simply outgrew our existing system," said Steve Ianuzzi, Controller for H.A. Bruno Inc., the trade exposition management company. "We decided to look right in our own backyard at last year's PC EXPO in New York, and we found that DataFlex provided everything we needed to turn our multi-user system into a powerful database machine."

DataFlex lets us control the data instead of it controlling us. "When we were producing only one show, our database needs were simple: a list of prospect names which could be flagged for invoicing as they registered," explained Ianuzzi, "but with several big shows a year, that system quickly became over-

whelmed. We needed software that would let us control the data instead of it controlling us. One company might be exhibiting in all our shows ...another in just two. Our accounting system had to be much more sophisticated than simply a list of prospects. Company profiles, listings for multiple shows and all sorts of details were needed in a form that could interface with our accounting system. We found that DataFlex would answer all of our database management needs."

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outside firm to inhouse," said Ianuzzi. "Now, what's behind the scenes at our high tech trade shows will be as sophisticated as what's in the booths!"

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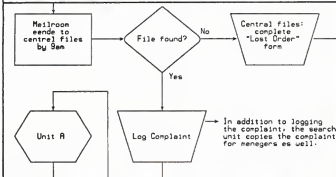
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* March 10, 1987 issue, page 276

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The chart fragment above was produced on an HP LaserJet-Plus and is actual size and untouched. Publication quality charts like this can be produced using only minutes of preparation time and seconds of print time.

CIRCLE 201 ON READER SERVICE CARD

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Information: (613) 544-6035 ext 49
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WORD PROCESSORS

Write's attractions. The program is a pro at handling files from other programs. It imports ASCII documents in a flash, giving you the option of stripping out end-of-line carriage returns automatically and transparently. It directly reads documents created with *WordStar* and *PFS:Write*, among others, and with programs that export to ASCII, like *PFS:Professional Write*, *MultiMate*, and *WordPerfect*.

You can run 1-2-3 or programs, such as *dBASE III*, *WordPerfect*, and others, from *Q&A Write's* main menu—if both *Q&A Write* and the alternate program have been saved onto a hard disk. When you decide to exit the alternate program, you return automatically to *Q&A Write*.

You can also import spreadsheets or ranges into *Q&A Write* documents and enhance them to create impressive reports, choosing among the nine fonts available. Easy use of 1-2-3, *Symphony*, and *dBASE II* and *III* data gives you the flexibility you need in a professional setting.

Q&A Write makes it easy to find files: displaying lists of those stored on your disks and enabling you to search using wildcards. Another convenience: you can use DOS's *RENAME*, *DELETE*, and *COPY* commands without exiting from the program. If you like, *Q&A Write* will automatically back up your files each time you retrieve them, updating the backup copy each time you save your data.

The search-and-replace function is high tech in *Q&A Write*: fast, flexible, and easily customized. You can use wildcards during a search, and you can search for carriage returns, new pages, text enhancements, and fonts.

The integrated Card File, with maximums of 1,000 records per file and 180 fields per record, gives you a handy searchable, sortable database of information and a powerful mail-merge function. Producing form letters, envelopes, proposals, and mailing labels from information in the Card File (or any ASCII data file) and text in your word processing documents is a cinch. Another handy capability is the program's math feature.

Superpowerful, supereasy, superfast, *Q&A Write* is superessential if you need a professional word processor that doesn't require hiring a personal trainer. It has all the answers.—Carol Olsen Day

R Word Plus

SUITABILITY TO TASK

Professional



Corporate

Personal

Legal

Desktop Publishing

1 2 3 4

R Word Plus, \$495 from R Systems, is puzzling. It's got muscle and brains but lacks beauty and finesse. The program can do almost anything you want, but the user interface seems half-finished. The program has no pop-up windows, split screens, or extended characters. Its menus and help screens lack pizzazz.

R Systems owns about 30 percent of the UNIX/Xenix/Venix word processing market, comparable to *WordPerfect's* DOS market share. If some features we've come to know from PC programs seem to be missing from *R Word Plus*, it's because the program was originally designed for a UNIX system and has a lot of hardware to contend with. UNIX was designed to be multiuser, and it runs on a wide variety of computers, most often using dumb terminals connecting to the CPU. Taking advantage of any single brand's features, was out of the question.

Once it had the UNIX market cornered, R Systems looked to the UNIX/PC market—offices that need compatible word-processing files for use in both environments. The result is *R Word Plus* for DOS.

R Word Plus has its own UNIX-compatible file format and system of directories (not DOS subdirectories), categories, and files. Your documents are identified within *R Word Plus* by a 20-character name, plus author's name, operator code, file type, and three 12-character keywords. You can locate files by searching on a word in the title or any combination of keywords. Once you leave *R Word Plus*, your files are identifiable only by number, and you cannot view them via the DOS TYPE command. *R Word Plus* can export its own files to DOS, though, and it can edit and import DOS text files.

EDITING The edit screen is fairly clean, with only four lines given to margin and tab settings, line and column numbers, and the frequent appearance of two-line menus. Two information lines follow the top of each page and the file bottom; they scroll off the screen as you move through the file. The ruler line reflects the format code active at the cursor. You may embed codes into any body, header, footer, or footnote line, permitting continuous control of pitch, lines per inch, margins, tabs, and justification. Math tabs are available for full five-function tables, and margins automatically adjust when you alter the print pitch.

The function keys are assigned to block text in character, word, sentence, line, paragraph, and page modes. Once you have selected the words you want, commands for enhancing and moving or deleting text appear in a two-line menu at the bottom of the screen. Pressing the question-mark key at any menu or command prompt presents a screen of help messages specific to that operation. While I found the on-screen help useful, it cannot replace the standard two-part manual (a loose-leaf tutorial and a spiral-bound reference guide).



FACT FILE



R Word Plus,
Version 4.0
R Systems Inc.
10310 Markison Rd.
Dallas, TX 75238
(214) 343-9188
List Price: \$495
Requires: 384K RAM,
DOS 2.0 or later.

In Short: Designed originally for UNIX/Xenix systems, *R Word Plus* is capable, full-featured, and now available in the DOS world. However, it lacks familiar PC features, such as pop-up windows, split screens, and extended characters. Not copy protected.
CIRCLE 600 ON READER SERVICE CARD

SPELLING One thing you won't get much help with is spelling. The spelling checker tells you when a word is misspelled, but you must look up the correct spelling in a dictionary. If you wish to add a word to your user dictionary, *R Word Plus* will ask you to hyphenate it for possible automatic hyphenation during pagination. Except for checking foreign words, *R Word Plus* performed quite well in the PC

Print Code Functions

| KEY | FUNCTION | KEY | FUNCTION |
|-----|--|-----|----------------------------------|
| A | Auto Numbering (0-9) | T | Table of Contents |
| B | Backspace for Over-Strike | U | Up 1/2 Line (Superscript) |
| C | Clock Date or Time | V | Data Base Field (0-999) |
| D | Down 1/2 Line (Subscript) | W | Advance to next data base Record |
| E | Get Print Position (1-9) | X | Extra Line Space in 40th inches |
| H | Wait Printer | Y | Font Change |
| I | Insert from Graphics | Z | No Carriage Return |
| J | Jump to Print Position (0-9) | [| Insert ASCII Code (00-7F) |
| K | Keep Lines Together | + | Increment Page Number |
| L | Required Pg. Break in EPC | 1 | Header instruction |
| M | Make Bold Next Character X | 2 | Footer instruction |
| N | No Line Feed | 3 | Footnote instruction |
| P | Page Insert (Doc. Assembly) | - | Required Hyphen |
| R | Right Align on Even/Odd Page & (SPACE) | | Required Space |
| S | Stop Instruction (0-99) | * | Report Generator Instruction |

For additional help, "?" at specific selection

(RETURN) to continue. "P" to PRINT this help

152

In *R Word Plus*, pressing ? at the print menu displays this screen, which is a virtual dumping ground for miscellaneous commands.

■ WORD PROCESSORS

Magazine test, missing only three of the test words. But it choked on *thesaurus*, *nouns*, and many common proper names. R Systems is working on a more up-to-date dictionary and a thesaurus for later release.

Document assembly, or boilerplating, is a breeze with *R Word Plus*. Instead of keeping frequently used passages in separate files, as do most word processors, *R Word Plus* lets you call specific pages from one file into another. You can print any file with the format codes showing you where pages will start and where codes begin and end. Since any line can carry its own formatting, the paragraphs or pages will be fully formatted when they print—you don't have to change a thing. Stopping the printer for text insertion during printing is easy, as is automatic updating of the current date in page headers.

R Word Plus's control over text formatting is impressive. Commands are available for variable line spacing, headers,

footers, automatically numbered footnotes, newspaper-style columns, case changes, character enhancements, and more. You can control printer functions, page numbering, odd/even page text alignment, date and time insertion, and database fields for mail-merge.

You get the feeling you're working with a sort of pre-PC-era *Microsoft Word*. You get no nifty windows, no graphics, and no desktop publishing, but you do get the impression that you can do anything with the tools *R Word Plus* offers.

As impressive as *R Word Plus* is, we cannot recommend it for a purely DOS environment. For the same money you can buy one or even two of the latest-generation DOS products and never look back. But if your office runs UNIX and DOS and you want a program that functions on multiuser networks and single-user machines, take a good look at *R Word Plus*.

—Michael Friedlander

Samna Plus IV

SUITABILITY TO TASK

| | | | | |
|--------------------|---|---|---|---|
| Professional | ● | ● | ● | ● |
| Corporate | ● | ● | ● | ● |
| Personal | ● | ● | ● | ■ |
| Legal | ● | ● | ● | ■ |
| Desktop Publishing | ● | ● | ■ | ■ |
| | 1 | 2 | 3 | 4 |

Samna Plus IV is a versatile word processor that combines ease of use with a powerful array of sophisticated features. *Samna* is equipped with all the routines that are becoming standard in corporate-level word processing packages: windows, automatic merge, index and table-of-contents generation, widow and orphan control, TSR program compatibility, soft hy-

Where we got the idea that something small
could be powerful.



phenation, a spelling checker, math mode, good WYSIWYG capability, line graphics, and support of compound documents. *Samna*'s printing features include editable print queues, printer escape sequences, multiple printer and sheet-feeder support, and driver files for over 175 printers, including laser printers.

Samna Plus IV is the most advanced in a family of word processing and office productivity products from Samna Corp. *Samna Plus IV* includes all the features of Samna's \$595 *Samna Word IV*. But for only \$100 more, *Samna Plus IV* adds a spreadsheet and Wordbase Manager, a text-retrieval program that conducts Boolean searches (those using AND/OR statements) in *Samna* files. Wordbase Manager can scan a directory or disk in one pass and send its output to a file or a printer.

The word processing program has outline generation, revision marking, equations processing, vertical centering, ad-

justable auto-save-to-disk, columns handling, searches for format-code symbols, foreign-language keyboards, forms processing, an on-screen sorting program, immediate access to all DOS functions, and macros.

You can create an unlimited number of macro files, suspend a macro for data entry, enter a command for terminating a macro at the end of a file, revise macros with an editor, or work with text macros.

STOCKED FOR CONVENIENCE You can also sort by line or paragraph, by up to four fields, and by a word within a field. When working with columns, you can keep related paragraphs in side-by-side columns horizontally aligned. The outline-generation routine permits you to use six levels and choose from three outline styles; or you can design your own style.

Well stocked with convenience features, *Samna* includes routines for file-

name entry from a directory list, retrieval of the last file stored, word counting, un-



FACT FILE



Samna Plus IV,
Version 1.1
Samna Corp.
2700 NE Expwy.,
Suite C-700
Atlanta, GA 30345
(800) 831-9679
List Price: \$695

Requires: 512K RAM, two disk drives (some features, including the spreadsheet, require a hard disk), DOS 2.0 or later.
In Short: A slow but powerful high-end word processing program. Among its other routines are revision marking, outlining, sorting, on-screen multiple columns, editable macros, and adjustable, command-oriented help screens. Not copy protected.

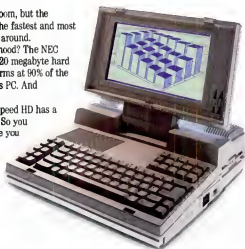
CIRCLE 66 ON READER SERVICE CARD

What we did with it.

You won't hear it say vroom, but the MultiSpeed™ HD is one of the fastest and most powerful laptop computers around.

What's it got under the hood? The NEC 16-bit V-30 processor and a 20 megabyte hard disk. Which means it performs at 90% of the level of an original AT class PC. And it's PC compatible.

What's more, the MultiSpeed HD has a brilliant backlit EL screen. So you can easily read it anywhere you choose to use it.



And when you're on the move, the Multi's easy to handle.

With switchable battery/AC power.

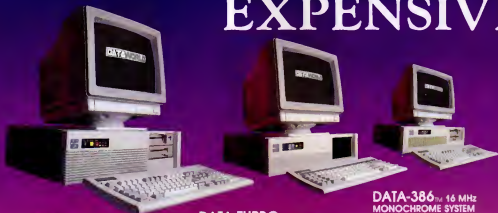
For product literature or the MultiSpeed dealer nearest you call 1-800-447-4700. Or for technical details call NEC Home Electronics (USA) Inc. at 1-800-NEC-SOFT.

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CIRCLE 291 ON READER SERVICE CARD



■ WORD PROCESSORS

HERE IS THE DIRECTORY LIST OF YOUR FILES.

| | Col | 6 | Ln | 1 | Ps | 1 | File | d | |
|--|----------|--------|--------------|----------|--------|---|------|---|---|
| OVERLAY.X | 18-26-87 | 11:47a | J0RY | 18-26-87 | 4:32p | | | | R |
| MARCIT | 18-26-87 | 4:33p | SAMMAZPC | 18-26-87 | 2:00p | | | | |
| BERIT | 18-26-87 | 4:33p | BERY | 18-26-87 | 4:34p | | | | |
| JEANETTE | 18-26-87 | 4:35p | FRANK | 18-26-87 | 12:17p | | | | |
| SCREEN08.CAP | 18-26-87 | 4:39p | SCREEN01.CAP | 18-26-87 | 4:40p | | | | |
| 3624% BYTES TOTAL, 388832 BYTES (83%) FREE | | | | | | | | | |

| L | T | T | T | T | T | T | T | T | R |
|--|---|---|---|---|---|---|---|---|---|
| The Autobiography of Benjamin Franklin | | | | | | | | | |
| <p>I have ever had a Pleasure in obtaining any little Anecdotes of my Ancestors. You may remember the Enquiries I made among the Remains of my Relations when you were with me in England; and the Journey I took for that purpose. Now imagining it may be equally agreeable to you to know the Circumstances of my Life, many of which you are yet unacquainted with; and expecting a Weeks uninterrupted Leisure in my present Country Retirement, I sit down to write them for you. To which I have besides some other</p> | | | | | | | | | |

Samna Plus IV's windows let you look at a directory in one window and a file in another; you can also display different files or portions of the same file. Ruler lines are always shown for both files.

delete, undoing or repeating the last command executed, automatic date stamping, and—one of my favorites—a spelling-checker option to bypass a word (such as a proper name) temporarily when you don't want to add it to the user dictionary.

Samna offers a number of compatible add-on programs at extra cost, including *Decision Graphics* (\$450); French, German, medical, and legal spelling checkers (\$50 for language dictionaries; \$79.95 for professional dictionaries); and the Law Series, a set of boiler-plate legal documents (\$695). Versions of the program are available for 386-based computers; for the IBM PS/2 series; for Sharp, Hewlett-Packard, Texas Instruments, and AT&T personal computers; and for the Novell, 3Com, IBM PC Net, and AT&T StarLAN networking systems. Samna also easily transfers files to and from UNIX-based systems; and runs under UNIX on PCs and minis, including the AT&T 3B series, NCR Tower 32/400, and the Convergent Technologies S series.

Samna's wide variety of features may suggest that it is difficult to master, but, in fact, working with it is a breeze. Installation is simple, and the program's design is

logical and intuitive. Whenever possible, Samna commands invoke the function keys, which makes for brisk command entry. Menus are avoided except when so many options are offered that function key commands might be confusing, as when you're sorting data or setting defaults. The commands that use both function and alpha keys are mnemonic. Whenever possible, a series of related routines is clustered on a specific function key; thus, for example, the F3 key is dedicated to printing operations.

One of Samna's best features is its command-specific help facility, which is extensive enough that you can learn most of the program without using the manual. The help levels are adjustable, and the prompts keep you informed about what the program is doing. The documentation is equally thorough.

Samna comes with 13 disks and over 1,000 pages of documentation that deal with the spreadsheet and text-retrieval facility, as well as the word processing program. The package also includes charts for PC, AT, and foreign-language keyboards; function-key templates; key-top labels (made of clear mylar so they don't obscure

the IBM key names); and a handy overlay sheet has been included for use in forms-processing layouts.

SOME DRAWBACKS Samna is a very big program, and it's terribly slow. In fact, it was among the slowest of the high-priced word processors tested in PC Labs. If speed is what you want, you won't find it here.

It has other drawbacks. Footnotes can't be double-spaced, the macros don't make use of conditional statements, and—though Samna is compatible with the *Word Finder* thesaurus program—it lacks an integrated thesaurus. But according to Said Mohammadioun, president of Samna Corp., all these problems will soon be corrected. Also in the works for the next (2.0) release of Samna are OS/2 support; sorted directory listings; a table-of-authorities feature for legal citations; compatibility with Lotus's .PC files and with *Page-Maker* files; and a preview display of graphics, fonts, page numbers, headers, superscripts, and footnotes that will give the program full WYSIWYG page imaging capabilities.

Samna is expensive and not as well known as some of its competitors. The

Samna Plus IV comes with over 1,000 pages of documentation that deal with the spreadsheet and text-retrieval facility, as well as the word processing program.

company's strategy has been to direct its marketing efforts toward large corporate purchasers rather than individual users. Samna is a pricey program and lacks some features, like a thesaurus, that are often found in less-expensive products. For a product with its features, it is easy to use, but you will sacrifice speed to get them.

—Rubin Rabinovitz

WORD PROCESSORS

Textra

SUITABILITY TO TASK

Professional
Corporate
Personal
Legal
Desktop Publishing



1 2 3 4

If you lost your shirt in the Crash of '87, take heart: for only \$29.95, Ann Arbor Software's *Textra*, Version 4.0, offers valuable features like pop-up menus, as well as speeds that rival or exceed those of many of the big names in word processing. Besides, learning to use it takes no time at all: clear, comprehensive help is always only a keystroke away.

For an additional \$40, you get a "subscription"—much like a magazine subscription—that gives you a fast, flexible spelling checker and DOS access as well as a few other improvements. Buying the subscription, called Version 5.0, guarantees you at least three other major features that the vendor has scheduled for release sometime early in 1988: a complete mail-merge feature, a split screen, and printer drivers for about 150 of the most common printers now in use.

Whether times are lean or fat, *Textra* is a boon for bargain hunters, especially students and cost-conscious entrepreneurial types. But *Textra* has always had more going for it than its rock-bottom price. Its performance in the highly competitive low-end market has won it an Editor's Choice designation (see "Personal Word Processors," *PC Magazine*, January 28, 1986, and "Low-Cost Word Processors: More Power for the Money," February 24, 1987.) A well-designed, easy-to-use, and fast personal word processor, it offers users who work with documents of up to about 40 pages practically everything they desire: easy basic text enhancements without special printer setup, simple page-layout adjustments, flexible search-and-replace operations, text "bookmarks," a customizable edit screen, an easy-to-follow manual and on-line help, easy-to-by-

pass menus, and much much more.

Textra's speed at bringing in an ASCII document is exceptional. It was nonplussed when faced with a request to retrieve a heavily formatted *XyWrite* document, which appeared on-screen in a flash.

UPWARD AND ONWARD But in these competitive times, no package can rest on its laurels—or its low cost. *Textra*, although challenged in the market by other aggressive low-end packages, has kept pace. With its latest update (the Winter '87 "issue" of its subscription version), *Textra's* value has skyrocketed with some new features and a new backer in the college-and-university market.

Since *PC Magazine* last reviewed *Textra*, the program has gained a new profile. Besides some smaller improvements, *Textra* now includes a fast built-in spelling checker with some super features, as well as handy DOS access found within the program itself.

Like *Textra's* other features, the spelling checker puts the accent on speed. Since you can proof a letter in under a second, now there's really no excuse for typos and misspellings. The spelling checker also in-

of my Ancestors. You may remember the Enquiries I made among the Remains of my Relations when you were with me In England; and the Journey I took for that purpose. Now Imagining it may be equally agreeable to you to know the Circumstances of my Life, many of which you are yet unacquainted with; and expecting a Weeks uninterrupted Leisure in my present Country Retirement, I sit down to write them for you. To which I have besides some other Inducements. Having emerg'd from the Poverty & Obscurity in which I was born & bred, to a State of Affluence & some Degree of Reputation in the World, and having gone so far thro' Life with a Felicity, the conducting Means I made Blessing of God, so well succeeded, I know, as they may find some of them Situations, & therefore fit to be in when I reflected on it, has Induc'd me were it offer'd to my Choice, I should Repetition of the same Life from its Advantage Authors have in a second some Faults of the first. So would I the Faults, change some singular Accidents more favourable, but tho' this still accept the Offer. However, since Select the font you'd like to highlight with...

Highlighting - Repeat F12 Some commands related to Highlighting

Textra's highlight command (F4) invokes this menu. After you select one of the choices for enhancing text, *Textra* will prompt you to indicate the beginning and end of the text that you want to enhance.



FACT FILE



Textra, Versions 4.0 and 5.0

Ann Arbor Software
345 S. Division
Ann Arbor, MI 48104
(313) 769-9088
List Price: \$29.95; Version 5.0 (subscription), \$69.95.

Requires: 256K RAM, one disk drive, DOS 2.0 or later.

In Short: A fast, inexpensive, and capable word processor for professional and personal use, this program's latest update has more than you'd expect for the price, including a spelling checker and DOS access. Printer drivers, promised for the next issue, are missing, but you can easily access enhancements—like boldface and underlining—without special printer commands or codes. Not copy protected.

CIRCLE 644 ON READER SERVICE CARD

cludes automatic word correction (eliminating, for example, the need to flag you when you've typed *teh* instead of *the*); helpful on-line usage notes about com-

F1 - bold
F2 - underline
F3 - bold + under
F4 - font 4
F5 - font 5
F6 - superscript
F7 - subscript
U - "unhighlight"

monly misused words like *affect* and *effect*; optional dictionary browsing; easy dictionary customizing; and dictionary-based (not algorithmic) hyphenation. While editing a document, you can check spelling in part or all of it. And you can customize the speller to ignore time-wasting nonwords like *RM45* and annoying single characters like *X*.

DOS access lets you type certain DOS commands at the prompt without exiting *Textra*. Now you can skip over to DOS to rename or delete a file or format a floppy disk on the fly. Also, all customizing of the program now takes place within the program itself; you no longer have to use a separate disk.

Ann Arbor Software promises to deliver two notable improvements missing from the versions we reviewed—printer drivers and mail-merge—in the next update to Version 5.0, at no additional cost to present users. Both additions will make

**DOS access lets you
type certain commands at
the prompt without
exiting *Textra*. Now you
can skip to DOS to
rename a file or format
a floppy disk.**

Textra a stronger product. While mail-merge will be a hefty bonus, printer drivers are a virtual necessity in the I've-got-more-than-you-do word-processing marketplace. Without them, a package loses credibility—no matter how satisfied its current users are with the printing capabilities.

Wisely, Ann Arbor Software is preparing drivers for about 150 of the most standard printers, even though it says its current users have made no complaints and are coping well with their printer setups. Currently, you can use the print command to invoke *Textra*'s print menu, which gives you a selection of double or triple spacing

and other formatting and page-layout options. Here's where you also indicate the printer port. The manual clearly explains the use of certain dot commands to set page breaks, to print unbroken blocks of text like tables, and to switch line spacing between single and double in the same document.

You can enhance your text with boldface, underlining, or both—without knowing the codes your printer uses to effect these changes. But for more advanced print enhancements you'll want to key in, on the printer command menu, the escape codes that your printer requires—for example, for subscripts and superscripts. The *Textra* manual clears up the confusion you're likely to encounter if you're not familiar with printer escape codes; the chief requirement is that you have a list of the codes your printer uses. In addition, you can embed printer commands in the text of your documents, also clearly and simply explained in the *Textra* manual. But shortly you'll be able to select your printer driver and sit back and let it do all the work—a change that will enhance not only your text but also *Textra*'s otherwise outstanding transparency and speed.

We'd recommend another, more minor change: a way to exit without saving your edits. As it stands now, you have to use a roundabout save method to exit to DOS in order to abort a document, and then you must reenter *Textra* and retrieve or begin a new document. Alternately, you can delete everything and start again. Both methods are a bit clumsy.

NEW BACKER Already well established in the college marketplace, *Textra* is now even more accessible to students and educators. Last June, Ann Arbor Software announced its exclusive marketing agreement with New York-based W. W. Norton Publishing Co. known by every student who ever cracked the covers of the Norton anthologies. Perhaps the future will see the Norton/*Textra* edition become as familiar a fixture on college bookstore shelves as the Norton books now are.

Like savvy investors and traders, students are always on the lookout for a bargain. They—and you—won't get burned with an investment like high-value, low-priced *Textra*.—Carol Olsen Day

Typist

SUITABILITY TO TASK

Professional

Corporate

Personal

Legal

Desktop Publishing



Typist is an inexpensive, low-end word processor from Atrius Inc. The program, listed at \$45, offers novice word-processor users a quick tool for preparing memos and other simple documents. While it is quite satisfactory for this purpose, an experienced user will soon want more advanced features than *Typist* can provide.

A new user can implement nearly all of *Typist*'s features without ever referring to the manual; blocks along the lower border of the screen indicate which function keys to press as you go through the main menu and submenus. Some Ctrl-key combinations are available as shortcuts. This guidance is complemented by context-sensitive help along with an advisory line at the top of the screen that offers more specific advice, such as "Type the name of the desired printer port (like 'LPT1').".

Typist's spelling checker is unusually good for what is otherwise a basic product. It highlights misspelled words, can be set



FACT FILE



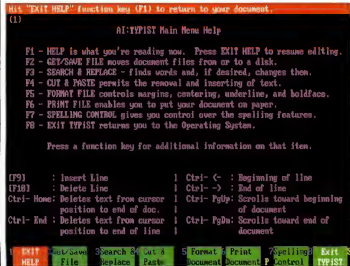
Typist, Version 1.16
Atrius Inc.
10200 SW Nimbus
Ave., Suite G-5
Portland, OR 97223
(503) 620-7000
List Price: \$45
Requires: 256K RAM,

two disk drives, DOS 2.0 or later.

In Short: This scaled-down, inexpensive package is easy to use and has a spelling checker, but cannot print page numbers or headers and footers. Satisfactory for occasional use. Not copy protected.

CIRCLE 67 ON READER SERVICE CARD

WORD PROCESSORS



Typist offers directions on the top line of the screen, as well as context-sensitive help. The blocks on the lower border refer to function keys, but Ctrl-letter key combinations offer some shortcuts.

to beep, and checks spelling either as you type or only on request. The main dictionary contains 26,000 words, and you can add up to 20,000 words to a secondary dictionary.

The straightforward cut-and-paste feature marks blocks of text by highlighting them. The search-and-replace function is

Typist's Define Printer screen combines printer selection and print-formatting features.

case sensitive but does not let you distinguish between discrete words and strings of letters within words.

A single Define Printer screen combines printer selection and print-formatting features. This menu allows you to specify a page length, the number of lines for top and bottom margins, and the column number in which to start printing the left mar-

gin. It even permits you to alter the printer codes for turning boldface and underlining on and off. For more advanced users, the manual explains how to embed printer control codes within your text.

This single printing menu may reduce confusion for a new or occasional user, but it also severely limits *Typist*'s capabilities: the program cannot prepare headers and footers, nor can it automatically number pages. These two deficiencies will force users to look for an upgrade much sooner than they would otherwise.

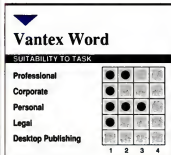
When an error occurs, *Typist* mollifies the added author by suggesting possible causes and by asking for his assistance. The one time that *Typist* does too much coddling is when you get a new file: if you are not sure of the filename, it can take up to five keystrokes, plus typing in the filename, to obtain the document.

Typist's small but well-organized manual includes installation and reference sections along with an easy-to-follow tutorial. The appendixes explain troubleshooting, parameter lists that you can use when calling the software, Ctrl-key commands, and printer control codes. If you need more help than the manual can offer, there is a

technical support hotline; the staff will give you prompt and patient assistance.

Airus designed *Typist* to help the user get from turning on the computer to typing a document in the shortest possible time. For this reason, it is often bundled on hard disks in PC clones and in OEM packages. If *Typist*'s printed-page-formatting features were extended, this word processor would be useful for a longer period of time. Still, its friendliness and price (recently reduced from \$99.95) make it a low-risk choice for the casual user.

—Stephanie Stallings



Vantex Word, priced at \$119.99 from Vantex Data Systems, is a command-driven word processor. In an arena dominated by ponderous, menu-driven programs, this lean package offers a host of useful features and a decidedly different user interface. Its performance is marred, however, by a few cumbersome features and occasional bugs.

While most PC word processors offer menus to guide you, *Vantex Word* requires you to enter terse operation codes on a command line. For example, to print a file, you go to the command line and type "F" followed by the name of a file to use, then "PRT" to print it. This style, which is more prevalent on mini and mainframe word-processing and typesetting systems, appeals to do-it-yourself types who prefer a spare interface without intrusive menus.

Installing the two-disk package (one for the program itself, the other for the spelling dictionary) is a snap. The program's documentation consists of a concise, clearly written, perfect-bound manual contain-

XyWrite III Plus: For People Who Write



People who write a lot have always depended on XyWrite to get the job done. Datapro Research Corporation said XyWrite III was "...the fastest word processor...its power and flexibility are unmatched." Now XyWrite III Plus introduces authoring tools that will make you even more productive than before.

XyWrite III Plus has the flexibility to handle all of your writing needs, from simple letters and memos to special applications such as audio-visual scripts with multiple independent columns, or complex research papers which require one-key switching between notes, outlines and drafts - up to nine different files in nine "windows."

The on-line *Spelling Checker* sports a 100,000-word dictionary to help prevent embarrassing, and costly, typos. Check your spelling as you work. Or, if you'd prefer not to break your train of thought, wait and check the entire

document when you've finished writing it. You can even check multiple files with a single command. A unique shorthand feature saves valuable time by expanding predefined abbreviations; "asap" becomes "as soon as possible" instantaneously! And the renowned 220,000-word *Microlytics' WordFinder® Thesaurus* enhances creativity, putting alternative words at your fingertips.

Use the *Redlining* feature to edit another writer's document. Mark suggested changes to the text but leave the original material intact. Combine *Redlining* with *Hidden Notes* and you have an ideal way to share thoughts with the original author.

XyWrite III Plus provides unmatched laser printer support (including PostScript) for desktop publishing. Whether you're using cartridge or downloadable fonts, or mixing different point sizes on a line, XyWrite III Plus will automatically hyphenate and justify...as you type. A host of vertical spacing commands give you maximum control over vertical movement as well. And XyWrite III Plus lets you *Include* ready-to-print files from other sources, eliminating the need to cut and paste.

The superior output capabilities of XyWrite III Plus, combined with an established reputation for speed and flexibility, clearly

indicate that there is only one choice for word processing software. If you write, you need XyWrite III Plus. For more information and the name of a dealer near you, call or write today.



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CIRCLE 516 ON READER SERVICE CARD

■ WORD PROCESSORS

COMMAND=> demo.txt

```
< operator: Gene S. >
< document: 1987/11/ 1 Vantex Screen Example >
< comment: To be used to show how screen looks during typical edit
  < font selection: 2 >
  < pitch (8 for PS): 8 >
  < paragraph indents - first 5 >
```

The first line above shows the command used to assign a filename for this text. The "< lines >" following it are non-printing comments and page formatting objects.

This text is being entered in paragraph mode, as confirmed by the "P" on the status line below. The left and right margin indicators have been turned on. The program uses color only to distinguish characters with **attributes** like boldface and underline (to tell which setting is active requires placing the cursor on the special character and pressing the F6 key).

EMO.TXT P 3% 8% f SCROLL=> half

This is a second window. Notice how all status, command, tab, and margin lines have been turned off. This area is used to edit secondary files, to move/copy text from one document to another, for "mail-merge" data, etc. The size of both windows is adjustable and can be set as defaults in the system parameter file.

Because several key commands were assigned to function keys, Vantex Word users can work a long time before having to turn on the command line.

In this sample of Vantex Word's dual-window screen, the document shows embedded format symbols above the text. Characters with special attributes are highlighted in color but not distinguished as to type.

ing tutorial, setup, and operating instructions. Also supplied are a function key card and a useful summary reference fold-out. A single key summons on-line, context-sensitive help.

Vantex Word is not WYSIWYG. It displays documents within user-defined margins, which may or may not be the same as those that will appear on the printed page. Therefore, to determine the correctness of a document's margins—as well as its pagination and other embedded "format objects"—you must print it.

The program's screen layout options are flexible. Up to 20 lines of on-screen text may be contained within a box bordered by command, tab, and status lines. You can turn any one of the nontext information lines off to allow up to 25 lines of text to be displayed. In dual-window mode, up to 24 lines are available for editing two separate files. Along with the nonblinking block cursor option, users can enjoy a serene tabula rasa on which to compose their text.

Other aspects of the program are also highly flexible. You can specify and save in a control text file such elements as de-

fault screen, directory, backup, cursor, tab, and session parameters. Editing the keyboard layout table redefines the keyboard.

You can edit or compose from scratch any one of the three printer definitions accessible during a session (a valuable feature for owners of oddball printers that word processors do not usually support). The program will queue print jobs, and you can pause, delete, restart, and repeat printing.

Vantex Word allows a high degree of control over printed output and provides sophisticated multifont and spacing features like those used by high-end printers. The program also offers special features for printing labels and envelopes as well as sorting and merging data with form letters.

MAGIC DIAMOND Commands do not initiate all editing operations. The keypad or the "magic diamond" made famous by WordStar (Ctrl-E to go up, Ctrl-X to go down, and so forth) controls cursor movement. Special print "qualities" such as boldface and underscore are imparted via control keys such as Ctrl-B and Ctrl-U.

Save, block, format, spelling, find/replace, delete, and screen settings are linked to function keys. Especially handy is the way you can back up and save a file with one keystroke without having to confirm the replacement of the original file.

Vantex Word requires you to enter text either in line or paragraph mode, resulting in two types of text "objects" that are handled differently. For example, line objects may be centered, whereas paragraph objects may not. This aspect of the program can be irksome; it's less preferable than the simpler method of distinguishing lines from paragraphs, like the one WordStar, WordPerfect, and others use.

While the overall speed and feel of the Vantex Word are satisfactory, when tested the program had problems with large files and occasionally froze; a number of improvements and additions are in order.

The spelling checker is cumbersome to use and does not replace misspellings directly. Many block operations, such as splitting a large paragraph into smaller paragraphs and using the search-and-replace technique, are awkward. There is no undo facility, and the program makes you yearn for command-line-oriented features that allow you to repeat or edit previously issued commands easily. The program could also make better use of color.

Vantex Word offers the facility to maintain up to ten user-defined macros to automate boilerplate text entry or to combine complex command sequences. Since it co-



FACT FILE

| | |
|-----------------------------------|---|
| | Vantex Word,
Version 2.0
Vantex Data Systems
P.O. Box 507
Chatham, NJ 07928
(201) 635-5686
List Price: \$119.99
Requires: 256K RAM,
one disk drive, DOS 2.0 or later. |
| | In Short: This command-driven word processor is not WYSIWYG, but it offers good screen and print control; some cumbersome features and occasional bugs impair the otherwise flexible, efficient interface. Not copy protected. |
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■ WORD PROCESSORS

exists well with terminate-and-stay-resident (TSR) programs and requires very little memory to operate, expanding its macro and lexical facilities with specialized TSRs of your choice would be a snap.

All in all, *Vantex Word* is an interesting, albeit flawed, alternative to today's crop of muscle-bound word processors. If the next version is a little more reliable and less cumbersome, *Vantex Word* may become a real contender.

—Gene Smilgiewicz

Varsity Scripsit

SUITABILITY TO TASK

References

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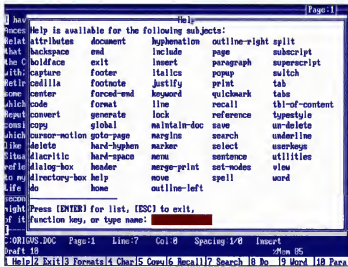
Desktop Publishing



Tandy Corp.'s *Varsity Scripsit*, released at the Fall Comdex show, is a feature-rich, powerful word processor offered at an attractive price of \$99.95. Although *Varsity* shares the name *Scripsit* with a long line of word processors dating back to the TRS-80 Model I, it's a new product, designed from the ground up.

As the name *Varsity* implies, the target market for this program is clearly the academic user. The footnoting feature, not normally found in word processors in its price range, is easy to use and gives you the option of footnotes at the bottom of the page where the reference occurs or at the end of the document. Moving text that contains a footnote reference, or deleting a footnote reference, causes all other footnotes and references to be renumbered automatically.

Installing *Varsity Scripts* is straightforward. The menu-driven install program will configure the program to your specific hardware and, if you have a hard disk, copy all the files to a subdirectory. If you are using a color monitor, you have a choice of eight background and 16 fore-



Varsity Scripts's help list—accessed from choices at the bottom of the screen—shows all the functions for which on-line help is available.

ground colors for each text style. Since *Varsity Script* operates in the text mode only, it shows bold, italic, and underlined text styles on the screen in the colors selected.

The program uses a series of pop-up menus. Once in a menu, you can select a function by moving the highlight bar to the function desired and hitting Enter or by typing the first letter of the function. On-line help is always available, invoked by the industry-standard F1 key. Help is generally context sensitive, but some functions require you to type the function name or related function key at the help menu to see the correct help screen.


Varsity Scripsit's text entry screen is uncluttered, with only four lines of nontext information at the bottom of the screen. The first line at the bottom shows you the currently defined ruler with margin and tab settings and cursor position. The next line displays the document name, page number, line number, cursor column number, line and paragraph spacing, and insert/overstrike mode. The line and paragraph spacing indicator is important, since the program will not display double spacing or extra lines between paragraphs of a

document on the screen.

The third line shows you the selected font for the current paragraph and the amount of free memory available. The fourth line displays a banner showing the function associated with each of the function keys. The program uses all 40 possible combinations of the ten function keys and the Alt, Ctrl, and Shift keys. When you

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FACT FILE



Varsity Script
Word Processing

Varsity Script,
Version 1.0
Tandy Corp.
One Tandy Center
Fort Worth, TX 76102
(817) 390-3700
List Price: \$99.95
Requires: 384K RAM,
one disk drive, DOS 2.11 or later.

In Short: Features like footnoting, table-of-contents generation, and split windows make this program ideal for personal and academic use; but sluggish performance and an awkward mail-merge utility limit its usefulness in a corporate environment. Not copy protected.

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■ WORD PROCESSORS

press either the Alt, Ctrl, or Shift key, the labels in the banner change to show the alternate uses of the function keys. This system really speeds up the learning process and nicely reduces your dependency on the manual.

Document storage and retrieval is also menu driven. If you like, *Varsity Scripts* will back up your document automatically each time you save. The program will also warn you to save your work should you try to exit without having saved your latest revision.

Since *Varsity Scripts* uses its own file format, you cannot view its files with the DOS TYPE command. You can directly import ASCII files, but you must first use a convert utility to change a file to the *Varsity* format before you can format it. Hard carriage returns, which you would normally find at the ends of lines on files you import, do not disappear during import or file conversion. Since the search-and-replace function can search for but not replace format codes, getting rid of unwanted carriage returns is cumbersome.

You can split the screen either vertically or horizontally into two windows. You can then edit different parts of the same document or two different documents in the windows. This feature is important because although you can include another *Varsity Scripts* document in the middle of your existing document when you print, you cannot directly merge an external document into your working copy. You must use the split-screen function, load the second document into the second window, and move the text into the first window.

Varsity Scripts comes with a built-in spelling checker. You can check a marked block of text or the entire document. When the spelling checker stops at each questionable word, a pop-up window gives you six options: Correct, Skip, Ignore same word, Add to user list, Edit word, and Quit. If you select Correct, the spelling checker will access the disk, present its first guess at the highlighted cursor position, and ask if you accept. If you don't accept its first guess and ask for the next suggested word, it has to access the disk again. This process can be aggravatingly slow. A better method would be to see the whole list of suggested corrections presented and select from that list.

Varsity Scripts provides a merge-print function for generating form letters. Using it is somewhat cumbersome, though, as you have to create the "base" or form letter file, a "code name" file containing the variable names to be used, and an ASCII comma-delimited "variable" file containing names and addresses. You have no conditional printing options. It will print a form letter for each record that appears in the "variable" file.

Tandy included some nice features that I had not counted on seeing in a word processor in this price range. Automatic hyphenation, table-of-contents and keyword-index generation, ten user-definable macros, 27 reference markers, paragraph locking and widow control, line drawing, and a diacritic function to print phonetic symbols are just some of the many features that add great value to this reasonably priced package.

SLOW EXECUTION You pay a non-monetary toll, though, in exchange for all of *Varsity Scripts*'s powerful features: sluggish program execution on some functions. On a standard 4.77-MHz PC, a good typist will be able to type ahead of the program. This is particularly evident at the end of lines where word wrap occurs, but the program loses no letters. Since *Varsity Scripts* is constantly recalculating paragraph formats and pagination (unless autopagination is disabled), moving or deleting large blocks of text is also quite time-consuming.

One aspect of *Varsity Scripts* that could use improvement is the documentation. The manual opens with clear, solid chapters on installation and setup, and a 25-page "Learning *Varsity*" tutorial. But the balance of the manual organizes the functions alphabetically by function name (as in the DOS manual), rather than by functionally related topics. Although each function description is complete and accurate and directs you to related functions, you must spend a lot of time paging through the manual.

Once you learn the program and put the documentation away, *Varsity Scripts* has a good solid feel to it. Unlike some competing word processors at similar prices, it can work with large files. For the personal and academic user, the benefits of all the

available features probably outweigh the design compromises made on speed. In the Tandy tradition, *Varsity Scripts* is a solid, well-designed program that offers good value for your dollar. —Craig Ellison

Volkswriter Deluxe Plus

SUITABILITY TO TASK

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Legal

Desktop Publishing



Volkswriter Deluxe Plus, a \$99 program from Lifetree Software, defies the assumption that you can't get much in word processing software for such a low price. The *Plus* in its name signifies that a spelling checker has been added to its predecessor, *Volkswriter Deluxe*, Version 2.2. The *Deluxe* edition is the personal word processor in Lifetree's *Volkswriter* family. Its cousin, *Volkswriter 3* (also reviewed here) is designed for corporate duties.

The package consists of two disks, which are quickly installed by the batch files that come with the program. The first disk contains the programs, which are relatively small, while the second contains the utilities and tutorials.

The documentation, which is only about 130 pages long, is written with first-time word processing users in mind. Basic and to the point, it explains terms and concepts only in as much depth as is necessary for the job at hand. It isn't so brief, however, that it leaves you with the feeling that you're missing something.

When you start the program, the first screen you see is a menu of about 12 choices, including such operations as Display Files, Retrieve, Edit, Help, and Exit. The program is so friendly, it's even polite. When it doesn't understand what you are trying to tell it, it says, "Beg your pardon?" When error messages occur as the



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■ WORD PROCESSORS

| Function | Key | F1 | F2 | F3 | F4 | F5 | F6 | F7 | F8 | F9 | F10 |
|-------------|--------|-------|-------|-------|---------|---------|------|--------|----------|-------|-----|
| By Itself: | HELP | SPELL | ←→ | WORD | BLOCK | BLOCK | FIND | REFORM | TAB/MARG | RESET | |
| With ALT: | PRINT | READ | +LINE | -TEXT | MOVE | COPY | REPL | -BLOCK | CENTER | EXIT | |
| With CTRL: | FORMAT | NOTE | PROOF | -LINE | +COLUMN | +COLUMN | PAGE | | | STORE | |
| With SHIFT: | SUBSCR | SUPER | FONT1 | FONT2 | FONT3 | FONT4 | BOLD | OURSTR | UNDERLIN | SHADO | |

respect for his Judgement and Advice. He was also much consulted by private Persons about their Affairs when any Difficulty occur'd, & frequently chosen an Arbitrator between contending Parties.—At his Table he lik'd to have as often as he could, some sensible Friend or Neighbour, to converse with, and always took care to start some ingenious or useful Topic for Discourse, which might tend to improve the Minds of *Travelers and Shamons*. By this means he turn'd our Attention toutdient in the Conduct of life; and little or no Notice was ever taken of what related to the *Victuals on the Table*, whether it was well or ill dress'd, in or out of season, of good or bad flavour, preferable or inferior to this or that other thing of the kind; so that I was bro't up in such a perfect Inattention to these Matters as to be quite indifferent what kind of Food was set before me; and so unobservant of it, that to this Day, if I am ask'd I can scarce tell, a few Hours after Dinner, what I din'd upon.— This has been a Convenience to me in travelling, where my Companions have

Volkswriter Deluxe Plus embeds and displays codes that yield enhancements like underlining or boldface. On a color or enhanced screen, the marked text is displayed in color, together with the start and end codes.

result of errors that are not obvious, though, on-line help does not explain in much depth what to do differently.

Volkswriter Deluxe Plus is basically an ASCII text editor with flair. File format is identical to the format of files created with DOS's EDLIN. It can edit any files created

using this standard, so long as each line ends with a carriage return and a line-feed character. And as an ASCII text editor, the program can retrieve spreadsheets and other documents saved as a print file without having to translate them.

Volkswriter Deluxe Plus has many unexpected features, including spelling and merge capabilities. The spelling checker is good, even though it requires a few more keystrokes than might be necessary to suggest correct words or to replace them.

The program falls short or is a little weak in a few areas. These aren't really flaws, nor are they critical to its operation—they simply indicate the level of the program. One cosmetic drawback is that like the old WordStar, Volkswriter Deluxe Plus displays formatting codes within the document. The codes thus take up character space as the document is being edited. Until you get used to this system, it can be a little distracting. It becomes a problem when you are trying to align columns of text or numbers and the control codes throw off the alignment. Fortunately, you can temporarily remove these codes by using the "proof" function, which enables

you to view the document before you print it, in near-final form.

INDENTS One functional limitation is that Volkswriter Deluxe Plus will effectively allow only one margin setting per document. The only way around this limitation is to set the temporary margin, edit your indented paragraph, and then take care not to reform that particular paragraph after the margins are set back to their normal width. You have some latitude when indenting blocks of text using the paragraph indent feature. A paragraph indented with this feature will remain indented until you press the reset key or set a different temporary margin.

Tab settings operate differently than do margins. When a tab has been set and used, the document is filled with spaces between the margin and the tab. A disadvantage here is that if you must change the format of the document later, you can't merely change the tab settings on the ruler line; rather, you must add or delete the spaces used.

In addition to supporting a number of printers, Volkswriter Deluxe Plus lets you embed special printer codes into the document to take advantage of other features

As an ASCII text editor,
Volkswriter Deluxe Plus
can retrieve
spreadsheets without
translating them.

that your printer supports. Embedded codes accommodate nonprinting comments, footnotes, page numbers, and other document functions not dealt with in the default format file. For example, to print multiple copies of a single document, you embed a print command (intended to recall the document to be printed), save the file, and then print the file. The document will print, and when the program encounters the print command, it recalls the file and reprints it. You must monitor this process,



FACT FILE



Volkswriter Deluxe Plus, Version 1.0
 Lafayette Software Inc.
 411 Pacific St.
 Monterey, CA 93940
 (408) 373-4718
 List Price: \$99; upgrade from Volkswriter Deluxe.

Version 2.2, \$45.

Requires: 256K RAM, two disk drives, DOS 2.0 or later

In Short: A friendly, value-packed word processor for home and light business use. Not a big star like WordPerfect, but a solid performer for folks who want features at a bargain price. Not copy protected.



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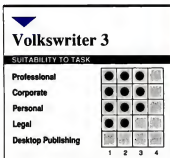
S 300

■ WORD PROCESSORS

though, because since you cannot specify the number of copies, printing will continue until you run out of paper.

When compared with a big star like *WordPerfect*, *Volkswriter Deluxe Plus* is not slick, particularly pretty, nor really intended for an environment in which sophisticated document building might be required. Without question, though, *Volkswriter Deluxe Plus* is good; considering its price, it is excellent.

—William H. Stewart



Like the eponymous Volkswagen, *Volkswriter 3* aims to be a product for the common folk—reliably supplying the functionality most people need but without a lot of pizzazz. Lifetree Software strongly emphasizes its straightforward operation and ease of use.

Installing *Volkswriter 3*, which lists for \$295, is easy and entirely automatic. Once installed, though, users without a hard disk will find loading it a bit cumbersome. Because the program files don't all fit on one disk, you have to swap floppy disks in the A: drive.

The word processor is driven entirely by clear, informative menus. *Volkswriter 3* lets you perform most standard editing functions efficiently, but it does have a few limitations. You can define text only by marking the beginning and the end of the block; you can't define a word or a line with one keystroke. And once you've defined a block, you can't copy it more than once without redefining it each time. If you make an accidental deletion, you're out of luck—there's no undelete command to restore it.



Volkswriter 3's Layouts menu shows you the format settings for the document's current layout (or style). You can change from one layout to another anywhere in the document.

Reformatting and rehyphenation after alterations are usually automatic, but some changes, such as creating a new style, require you to define the affected text and press a reformat key. And when you are inserting or deleting characters, reformatting doesn't begin until you move the cursor or press a function key. You can turn automatic reformatting off to speed things up, but the results soon look pretty ragged.

ANNOYING IDIOSYNCRASIES The program has some annoying idiosyncrasies. There's no way to scroll up or down a line at a time without moving the cursor to the edge of the screen. Although you can toggle from the default overstrike mode to insert, you're automatically back in overstrike each time you save a file or call up a new one.

Volkswriter 3 displays boldface and underline on-screen and lets you mark superscripts, superscripts, and a number of other fonts as well, which vary depending on your printer. You can alter these either manually or by means of the well-implemented search-and-replace function. To generate headers, footers, and page numbers automatically during printing, you

can insert commands that won't print out and are similar to *WordStar's* dot commands—each on its own line and preceded by two periods. There is no page-preview mode to let you see what the document will look like, however.

One of the program's best features is the way it uses style sheets. You do all document formatting by means of the Layouts

FACT FILE

Volkswriter 3,
Version 1.0
Lifetree Software
411 Pacific St.
Monterey, CA 93940
(800) 543-3873 (U.S.)
(800) 831-8722
(Canada)

List Price: \$295
Requires: 256K RAM, two disk drives,
DOS 2.0 or later.

In Short: The high-end product in Lifetree's *Volkswriter* line of word processors. Easy to learn and use, but sluggish reformatting makes it less than ideal for large documents. Not copy protected.

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WORD PROCESSORS

menu, which lets you set the margins, paragraph indents, justification, and so on for each style you wish to use. The menu shows you the settings for the style currently in effect and lets you flip easily through the other available styles. You can change styles anywhere in a document. If you save a style sheet, it will then be applied to all files bearing the extension that you specify. All documents that do not have a style sheet assigned to their extension use a default style sheet, which you can modify or replace.

Volkswriter 3 has a slick on-screen math capability. You can create columns of numbers that are automatically aligned by decimal point and then move or copy them from one column to another. Defining any column or row permits you to find the sum and have it automatically inserted at the cursor position. You can also define simple equations on-screen and calculate the answers.

The mail-merge facility requires your letter file to have the left margin set at column 1. In your mail-merge address file you are restricted to a single line for each address, with fields separated by commas (this usually means that you must scroll the screen left and right to read an entire record).


Volkswriter 3's spelling checker uses a 170,000-word dictionary, which Lifetree Software claims is the largest on the market. Although slower than some, it offers a good selection of alternative words when it flags an error, and its pop-up menu lets you make replacements automatically. It will also flag repeated words, spaces missing after punctuation, incorrect capitalization, and periods missing from abbreviations. You also have the option of adding flagged words to a personal dictionary that you can edit. With a file open on-screen, you can check single words or the entire file, but you can't check files on disk, nor can you check words as you type them.

Volkswriter 3 offers access to a wide range of printers through 97 different printer drivers, including several for the HP LaserJet. A set of more than 40 additional drivers is available from Lifetree for \$20. You can print files from the screen or from disk, either in their entirety or in part—although to print only the beginning of a file you must embed the command `..END` in

the text. You can also print multiple copies and chain documents together.

The documentation is good, and there are a number of nice on-screen tutorials that encourage interaction with the user. There's also on-line help, but this is rather skimpy—only two screens.

Volkswriter 3 is probably best suited for an office environment. Its style sheets make it particularly easy to switch among the standardized formats that office use may require. Anyone working with large documents, however, would most likely find the sluggish reformatting an obstacle.—Robert Kendall



Webster's NewWorld Writer I

SUITABILITY TO TASK


| | |
|--------------------|---------|
| Professional | ● ● ● ● |
| Corporate | ● ● ● ● |
| Personal | ● ● ● ● |
| Legal | ● ● ● ● |
| Desktop Publishing | ● ● ● ● |

1 2 3 4


Webster's NewWorld Writer I, Simon & Schuster's \$99.95 personal word processor, has a lot to live up to. When it comes to words, *Webster's NewWorld* has been a household name since the early '50s, first for dictionaries, and later, with the advent of PC software, for a spelling checker and thesaurus that has become the industry standard.

The setup for *Webster's* is so straightforward that you don't need an automatic setup program. You simply copy the files from the three distribution disks, either to a hard disk or to working floppies, and then type WWP. Before you use your printer, you'll need to select the Revise Setup option from the Misc menu and choose one of the 24 printer drivers. This same menu gives you control over the auto-save feature, the default format and heading style, and the default drives and paths.

One default you'll want to change is the color scheme of the screen. You can reset



FACT FILE



**Webster's NewWorld
Writer I, Version 1.05**
Simon & Schuster
Software
One Gulf + Western
Plaza
New York, NY 10023
(800) 624-0023

(800) 624-0024 (in N.J.)
(212) 373-8882
List Price: \$99.95
Requires: 256K, two disk drives, DOS 2.0
or later.

In Short: This personal word processor has a top-notch search-and-replace function, spelling checker, and thesaurus, but it lacks footnoting and mail-merge, and suffers from quirky file handling. Its manual is an excellent style guide for writers. Not copy protected.

CIRCLE 154 ON READER SERVICE CARD

the blue text on a black background (with a magenta-and-white status line and ruler) by using the screen-colorization program; it would do credit to Sherwin Williams.

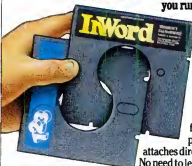
Webster's comes with a 206-page manual, half of which comprises a writer's guide and appendices. The guide offers tips on preparing book-length manuscripts, poetry, press releases, speeches, business correspondence, résumés, reports, and proposals. But it sorely needs examples demonstrating the proper forms for these documents. The lengthy appendices covering punctuation, wordiness, trite expressions, prepositions, and misused words will refresh your memory of English grammar usage.

The program has a Lotus-style command structure, with the Esc key substituting for the Slash key (/) as the hotkey. The main command menu offers nine choices: Search, Block, Appearance, Thesaurus, Check Spelling, Print, Files, Misc, and End. Selecting these topics invokes submenus. If the menus slow you down, you can access important features by using keystroke combinations instead.

Both context-sensitive help screens and an on-line mini-manual (activated by the F1 key) come to your rescue when needed. The context-sensitive help is unique: it's automatic. Once you select a command,

Now there's a real word processor that's just as attached to 1-2-3 as you are.

Introducing InWord. The complete word processor you run from inside 1-2-3.



Now, for everyone who's ever formed a meaningful relationship with 1-2-3, we offer a single word of advice—InWord.™

It's the full-fledged, full-function word processor that

attaches directly to Lotus 1-2-3. No need to leave your 1-2-3 session to get to InWord. No need

to leave InWord to get back to 1-2-3.

Best of all, InWord works wonders with your words in the same way 1-2-3 helps master your math.

Take full command of the language.

InWord is equipped with the kind of speed and performance that anyone could fall for. You get automatic word wrap and paragraph reform, horizontal scrolling, search and replace, cut and paste, cursor movement by word, sentence or paragraph. And there's more.

You can format your document with headers, footers, page numbers, tab stops, indents, and hanging indents. As well as left, right, center and full justification.

Plus you can print bold, underlined and italic text, and mix typefaces and pitch to your heart's content.

InWord gives you instant spreadsheet integration, plus powerful formatting and typestyle controls.

It's great to be connected with Lotus.

It's no coincidence that InWord gets along so beautifully with 1-2-3. In fact, InWord was developed especially for 1-2-3 Version 2 using software tools supplied by Lotus® themselves.

That means InWord is truly integrated with 1-2-3. So it's a breeze to transfer data directly from a spreadsheet to a document, or the other way around. And a snap to do lightning-like mailmerge operations straight from your 1-2-3 spreadsheet database.

You can even hotwire parts of your spreadsheet directly into your document. So any changes you make to your spreadsheet are instantly reflected in your document.

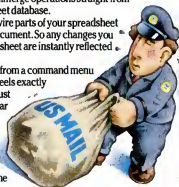
Plus, InWord runs from a command menu that looks, acts and feels exactly like 1-2-3 itself. You just can't get more familiar than that.

So if you've become hopelessly attached to the 1-2-3 habit, insist on the one word processor that shares your affection. InWord.

It's from the makers of Sideways, the world's leading 1-2-3 spreadsheet printing software.

See InWord at better computer dealers everywhere.

Or order direct from Funk Software with your check, Visa or MasterCard. At just \$99.95 a copy, InWord could be the last word you'll ever need.



With InWord, automatic mailmerge is as easy as selecting a range from your 1-2-3 spreadsheet database.

**FUNK
SOFTWARE**



InWord™

I'm hooked. Please send me _____ copies of InWord at just \$99.95 each.

☐ My check is enclosed ☐ Charge my _____ Visa _____ MasterCard _____

Account number _____ Exp date _____

Name _____ Title _____

Company _____

Address _____

City _____ State _____ Zip _____

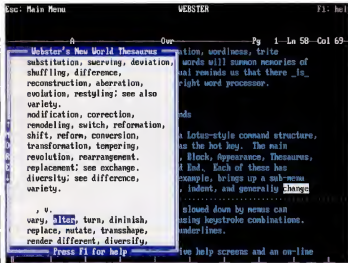
To Order call 1-800-822-3865, Ext. 115

(617-497-6339 In MA)

Requires 1-2-3 Version 2. Will not run with Version 1 or 1A.

Funk Software, 222 Third Street, Cambridge, MA 02142
© 1987 Funk Software. InWord is a trademark of Funk Software.

WORD PROCESSORS



An ample variety of alternatives for the word change can be quickly summoned through the 100,000-synonym thesaurus integrated with Webster's NewWorld Writer I.

you have about 2 seconds to complete the task or go to the next step. If you pause, *Webster's* pops up a help window that describes what to do next. He who hesitates is not lost, but rather is gently reminded of his options. You can toggle the feature on and off with Ctrl-F1—control the help—and you can adjust the delay time from the Revise Setup menu.

EVERYDAY FEATURES Although *Webster's* lacks some of the options (most notably mail-merge, footnotes, side-by-side columns, and macros) that would put it in the professional class, it abounds in the features necessary for everyday word processing. (*Webster's NewWorld Writer II*, scheduled for release in the second quarter of 1988, is a professional-class program with a strong mail-merge feature.)

The powerful search-and-replace command accommodates a wide variety of patterns in the search string, including hard spaces, characters in any sequence, an any-character-except option, and both hard- and soft-hyphen locators. You can set the case option to ignore or respect capitalization. And with the part-word option,

you can expand the search to include a word embedded in other words.

You may replace a word once or more than once. When the global option is on, *Webster's* substitutes the replacement throughout the document. This facility is valuable when replacing abbreviations with the full spelling, or when searching out and replacing overused or inappropriate words like *very* from your documents.

Webster's wants to be your word processor. To prove its worthiness, the package also includes the award-winning thesaurus and spelling checker. To activate the integrated thesaurus, you move the cursor to the word you want to replace, press Alt-T, and a window appears, listing synonyms. When you highlight your choice and press F10, *Webster's* will remove the old word and insert the new one. The replacement respects plurals, case, articles, and verb endings. Using *PC Magazine's* standard synonym test, *Webster's* found 33 synonyms for *love*, 6 for *platitude*, and 35 for *mortgage*; it generally does less well with foreign and colloquial words however, it did offer synonyms for *junta* and *gyp*.

The word processor is flawed, though,

by the peculiar way it handles files. It will not read a file from a disk that is write-protected. The publisher claims this is intentional, to prevent you from trying to edit a write-protected file. But it seems more like a bug. You can't, for example, review the contents of files on a write-protected disk without first copying them to an unprotected floppy or a hard disk.

Also, when you try to save to a full disk, *Webster's* insists that you either delete or move files to another disk to make room for the one you are trying to save. It will not let you insert an empty disk, save to a different drive, or even abort the save. While this won't be a problem for hard disk users, it's not a good way to handle an error situation.

Webster's NewWorld Writer I almost lives up to its auspicious heritage, though. It's easy to install, easy to use, and has the features you need for everyday personal and business writing. The program's automatic help feature, top-notch search and replace, built-in spelling checker, and outstanding thesaurus more than make up for its poor file handling.

—Donald B. Trivette

WordPerfect

SUITABILITY TO TASK

Professional

Corporate

Personal

Legal

Desktop Publishing



WordPerfect Corp.'s \$495 *WordPerfect* currently dominates the word processor market, enjoying a market share of about 30 percent. It's a feature-packed program you wouldn't want to use for something as simple as writing memos or compiling shopping lists. *WordPerfect* Corp. offers *Personal WordPerfect* for that.

WordPerfect takes only a second or two to load, and it greets you with its clean screen. A discreet status line at the lower

What's friendly, powerful and remembers everything about your 1-2-3 spreadsheets?



With Noteworthy, neither you nor others who use your spreadsheets need ever forget the true meaning of a cell.

doing things. Worse yet, try explaining it all to someone else.

Introducing Noteworthy - The professional spreadsheet annotator.

Now, thanks to new Noteworthy, it's easy to tame the most gigantic spreadsheets in creation. That's because Noteworthy is the first software ever to combine a majestic power for spreadsheet annotation with a gentle, cooperative nature.

Plus, it works alongside 1-2-3® in a way that no software has ever done before.

Want to remember why you put what you put in a cell? Just hit the hot-key and up pops a blank note. Then type away using Noteworthy's powerful built-in editor (it will remind you a lot of a full-featured word processor).

Create single notes up to 8,000 characters long. Make as many notes as you need, in a window of any size you choose, positioned on the screen where you want. Copy text from your note to a spreadsheet. From your spreadsheet to a note. Or from one note to another. Find and replace words and phrases automatically, in single notes, or throughout the spreadsheet.

Noteworthy even reminds you where you put your

CIRCLE 321 ON READER SERVICE CARD

It's a jungle in there.

Let's face it.

Some of your spreadsheets can be real beasts-with tons of formulas, assumptions, and complex interrelations between cells.

It's tough enough trying to remember your own reasons for

notes. Each time the cursor lands on an annotated cell, the note indicator lights up at the bottom of the screen.

Big news for heavy 1-2-3 users.

Despite its awesome power, Noteworthy is fast and reliable. That's because it doesn't lumber along in the background like some RAM resident utility. Instead, it runs as a bona-fide 1-2-3 add-in. In fact, Noteworthy is specially developed using new software tools supplied by Lotus® themselves.

That means true integration between 1-2-3 and Noteworthy. No clumsy interference with the keyboard or with background programs like SideKick.® And it consumes less than 50K, which means it virtually runs on peanuts.

So why burden yourself with the details of your spreadsheets, or with annotation software that doesn't pull its weight? Just remember Noteworthy. And you can forget everything else.

Look for Noteworthy at computer dealers on several continents. Or avoid the stampede and order direct from Funk Software with your check, Visa or MasterCard.

**FUNK
SOFTWARE
WARE**

Noteworthy™

For spreadsheets worth noting.

Please! Before I forget, send _____ copies of Noteworthy at \$79.95 each.

☐ My check is enclosed. Charge my _____ Visa _____ MasterCard

Account number _____ Exp. date _____

Name _____ Title _____

Company _____

Address _____

City _____ State _____ Zip _____

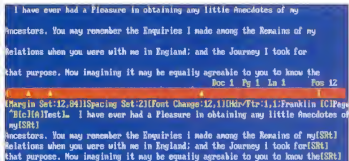
To order call 1-800-822-3865, Ext. 115
(617-497-6339 in MA)

Requires 1-2-3 Version 2 or Symphony.™ Will not run with 1-2-3 Version 1 or 1A.

Funk Software, 222 Third Street, Cambridge, MA 02142

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■ WORD PROCESSORS



The Reveal Codes screen in WordPerfect displays format codes that are invisible during normal editing. You can delete codes from the Reveal Codes screen, but text and codes can be added only from the normal editing screen.

right is the only reminder that the program is being used at all. There's no clutter, no opening menu, and you don't have to think up a filename before you start writing. You just start typing. When you're ready to save your work, you give it a name.

If you want to edit an existing file, you can enter its name or call it from a menu. You can display a ruler line if you insist, and you can split the screen into two windows or work on two full-screen windows. No formatting codes appear on-screen until you invoke a special command. The Reveal Codes screen allows only limited editing—a restriction that can frustrate advanced users but minimizes the chance of inadvertent damage.

WordPerfect uses the function keys—alone and in combination with Shift, Alt, and Ctrl—to invoke its menus and commands. Computer veterans often complain that these key combinations are arbitrary and confusing, and even experienced WordPerfect veterans often hit the wrong keys for commands they seldom use.

Dozens of small conveniences add up to make WordPerfect one of the most agreeable programs to work with. A three-

level undelete function rescues text that other programs would lose forever—and the function is smart enough to know that when you delete five words, for example, you're making only one deletion rather than five. You can turn underlining on and off simply by pressing a toggle key just to the left of the Left Shift key on the old-style PC keyboard. (Many of WordPerfect's key assignments are sensible only on the old keyboard; the new keyboard requires lots of athletic leaps from the Shift keys to the function keys across the top.)

You can print the current page with two keystrokes. You can link foreign characters or macros to Ctrl- or Alt-plus-alphabet-key combinations. Macros couldn't be simpler to write or use: you enter the keystrokes and let the program record them. (You need a separate editor to modify existing macros; it comes in the \$129 WordPerfect Library along with utilities like a calendar and calculator, or you can get it separately from WordPerfect Corp. for \$15.)

A Convert program gives clean conversions to and from IBM's DCA format, plus WordStar and MultiMate files. It also lets

you convert WordPerfect files into a format suitable for electronic mail, allowing you to send a file to another WordPerfect user without losing any formatting codes.

Writers happily produce books using WordPerfect and a dual floppy-disk-drive system with 256K. But they have to shuffle disks to use the help files, spelling checker, or thesaurus. Like any large program, WordPerfect is at its best with a hard disk. And the WordPerfect Library uses expanded memory for swapping WordPerfect and other large programs in and out of DOS.

FREE SUPPORT WordPerfect Corp. gives you unlimited toll-free telephone support, complete with courteous treatment—although you must endure some appalling music during your brief periods on hold. When the support people don't know the answer, they call back. An energetic WordPerfect forum on CompuServe offers advice, utilities, and free updates of program add-ons.

The only significant inconveniences in the current version of WordPerfect (Version 4.2) involve its block copies and moves—which require a more complex series of keystrokes than do similar operations in rival programs—and the difficulties you face when switching fonts. The first problem seems to be an almost permanent part of the program; the second will be corrected in the forthcoming Version 5.0.

EDITOR'S CHOICE



FACT FILE



WordPerfect, Version 4.2
WordPerfect Corp.
288 W. Center St.
Orem, UT 84407
(801) 225-5000
List Price: \$495
Requires: 256K RAM,
two disk drives, DOS 2.0 or later.

In Short: The present market leader in word processing programs. Easy import of files created in other leading programs—plus mail-merge, outlining, red-lining, table of authorities, and desktop publishing interface—makes it a corporate power to be reckoned with. Not copy protected.

CIRCLE 648 • READER SERVICE CARD

Announcing Silverado For Spreadsheets.

The Database You Already Know How To Use.

It's what you've been waiting for: a powerful database that resides within SuperCalc®4 and Lotus 1-2-3. One keystroke and you're in Silverado™ without leaving your spreadsheet. It's the first database designed specifically for spreadsheet users. Its familiar interface makes it a snap to be productive in a few minutes, because it runs just like SuperCalc4 and Lotus 1-2-3.

Analyze data in ways never before possible, automatically transfer data back to the spreadsheet with the dynamic linking feature. Silverado has virtually unlimited database capacity by utilizing extended memory and disk storage. The powerful relational and windowing features allow multiple databases imported from dBase III, 1-2-3, or ASCII files to be viewed simultaneously.

Silverado's powerful combination of database outlining, windowing, background recalculation, and report

summarization makes it the best add-in database ever designed for a spreadsheet. But here's the best part: it's the database you already know how to use.

Find out what Silverado can do for you. Call 800-533-2070 for more information or the dealer nearest you.

800 533-2070

File Database View Report Search Help Print Transfer Status 1-2-3
New Database New Spooling New Clunk New Status

| P | S | T | U | V | W |
|----|-------------------------------------|---|---|---|---|
| 75 | MONTH REGION PRODUCT UNITS SALES \$ | | | | |
| 76 | JAN-87 Easton Region 422 48,128 | | | | |
| 77 | Total for Easton 286 412,768 | | | | |
| 78 | Total for Region 308 238,576 | | | | |
| 79 | Total for Region 45 64,280 | | | | |
| 80 | Easton Region 162 12,916 | | | | |
| 81 | Total for Easton 286 412,768 | | | | |
| 82 | Total for Region 32 55,451 | | | | |
| 83 | Total for Region 272 35,741 | | | | |

Hit a few keys—see Sales by Product

800 533-2070

1-2-3

File Database View Report Search Help Print Transfer Status 1-2-3
New Database New Spooling New Clunk New Status

P S E B T 2 1 2 3 4 5 6

MONTH REGION PRODUCT UNITS SALES \$

Total for Easton 328 228,576
Total for Region 429 571,768

Total for Jan-87 1308 575,288

Total for Easton 561 522,476
Total for Region 488 225,761

Total for Feb-87 1410 582,913

Total for Easton 418 511,768
Total for Region 418 511,768

Hit another key—see Sales by Region

87-0107 Total for Jan-87

38.01

File Database View Report Search Help Print Transfer Status 1-2-3
New Database New Spooling New Clunk New Status

MONTH REGION PRODUCT UNITS SALES \$

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■ WORD PROCESSORS

Each successive annual version of *WordPerfect* has added important features and increased the program's already impressive ease of use. Version 4.2 includes the most intuitive and elegant of all spelling programs and a copious thesaurus. (WordPerfect Corp. advertises a mere 10,000 headwords in the thesaurus, but the program performed admirably in our tests.) The mail-merge feature includes easy ways to enter text from the keyboard and to review output before printing. The program sorts on different fields and performs four-function math.

WordPerfect includes outlining, document summaries, nonprinting comments, indexing (aided by easy-to-use concordance files), red-lining, line-numbering, tables of authorities for legal work, print preview, easy line drawing, and snaking and parallel columns. You can search for text in any file on disk, and you can import ASCII files with the option of removing extraneous carriage returns. No other program makes it easier to customize a printer driver.

The weakest area of *WordPerfect* 4.2 is its proportional printing. Every time you change fonts you have to recalculate margins, and it's almost impossible to incorporate mixed fonts in a single line. The program also makes only approximate calculations of line breaks, a weakness especially notable in justified text. All these problems are to be resolved in Version 5.0.

NEW IN NUMBER 5 *WordPerfect* 5.0, due for release around March, is expected to add some spectacular new features to this already powerful program—without making it more complicated to use. Page formats will be simpler to manage than ever, and laser printing with multiple fonts and sizes is virtually effortless. The program even supports color printing. Graphics files can be inserted anywhere into a text file and rotated or resized. A screen-capture utility lets you add graphics from nearly any other application. A fast and intuitive graphics-based preview mode displays every detail of the printed page, including color graphics, and lets you examine facing pages on the same screen. A set of more than a thousand characters will free users from the limits of IBM's character set.

Separate documents can be prepared by different users, combined into master documents, and later extracted for further editing in Version 5.0. Automatic cross-referencing can be used to link pages, figures, and notes. A comparison feature can automatically insert red-lining and strikeout into the modified version of a file. User-defined style commands allow easy control over every detail of the format.

You can buy versions of *WordPerfect* for the Amiga, Macintosh, Apple II, Atari, DEC Rainbow, and Data General computers, and an OS/2 version is in the works. You can buy two different reductions of the DOS version: the \$195 *Personal WordPerfect* (and its \$75 academic twin *Student WordPerfect*) and the \$89 *Junior WordPerfect*—although the \$200 street price of the full version makes the savings hardly worthwhile.

Executive WordPerfect, at \$249, combines the essentials of the larger program with a small spreadsheet and database designed for laptops. And *WordPerfect* integrates smoothly with its sibling programs, the *PlanPerfect* spreadsheet and the new *DataPerfect* database.

If you use *WordPerfect*, you're using the industry standard. It has supplanted the once-standard *WordStar*, and with good reason.—Edward Mendelson

WordStar Professional

SUITABILITY TO TASK

Professional

Corporate

Personal

Legal

Desktop Publishing



WordStar was one of the earliest microcomputer software packages to achieve widespread acceptance and was considered by many to be the first "real" microcomputer word-processing program. *WordStar*'s early lead in the marketplace



FACT FILE



WordStar Professional, Release 4.0
MicroPro International Corp.
33 San Pablo Ave.
San Rafael, CA 94903
(415) 227-5609
List Price: \$395

Required: 320K RAM, two disk drives, DOS 3.3 or later.

In Short: *WordStar Professional 4.0* is a speeded-up and slicker version of the traditional *WordStar* program. It's a high-powered professional program with lots of features and aftermarket support. Not copy protected.

CIRCLE 665 ON READER SERVICE CARD

dwindled, however, as new, fuller-featured packages appeared and as MicroPro International Corp.'s reputation for poor customer support spread. A few years ago, calls for help resulted in the callers' being directed to a local dealer. Today MicroPro has 70 employees who answer toll-free support lines. A bimonthly newsletter is now sent to all registered users at no charge and paid subscribers have had their money refunded.

WordStar Professional, Release 4.0, the current version of the classic *WordStar* program, lists for \$395 and sold 170,000 copies in the 6 months after its release in February 1987. Forty percent of those copies were upgrades. The other 60 percent indicate the program's continued presence in the microcomputer world. In all, MicroPro has sold more than 3 million copies of word processing software.

To install *WordStar* you copy the program, dictionary, and installation disks to the desired directory and drive. Two installation programs are supplied: use *WSINSTALL* if you want to use the default directory and settings, *WSCHANGE* to be able to alter all possible defaults. The latter program is totally menu driven and allows you to select screen colors and many other settings, including startup parameters such as line spacing and justification. *Word Finder*, the thesaurus, has two additional disks that must be copied. A separate install program generates a regis-

WordStar Professional Release 4

To skip further questions, press the Esc key at any point. Press **←** at any question to use the default answer.

Document to print? 3pt
 ← done ^U cancel ^R repeat ^S left ^D right ^Del char ^G char ^Y all
 ^X directory ^P literal ^A wd lf ^F wd rt ^H left ^Y word

Number of copies?
 Pause between pages (Y/N)?
 Use form feeds (Y/N)?
 Starting page?
 Ending page?
 Nondocument (Y/N)?
 Name of printer? hpl:ad

| DIRECTORY (IBMPC) | | Printers | | | | | | | |
|-------------------|--------|----------|--------|--------|--------|--------|--------|--------|--|
| 386CS | 638MP | ASCI | ANULF | C155B | CITWSP | CUSTOM | I2188P | DIABLO | |
| UBAFT | FX80 | FX85 | CEH18X | HPL:AD | HPL:Y | HPL:U | HPL:Y | HPLJET | |
| HPTJ1 | IBMCLR | IBMGR | IBMPO | IBMQU | IBMWP | IBMWP | LBP8 | LP300 | |
| LP4800 | LQ1500 | LQ800 | LX80 | ML102 | ML1021 | ML192 | ML1921 | ML292 | |

Whenever you print a document with WordStar Professional, you can make several decisions about that particular printing job. Choosing a printer driver other than the installed default driver is a simple process of selecting from a list of printers.

training number based on your name and address. After everything is installed you can delete the installation files.

WordStar comes with a program overview, a tutorial on-disk, and a ten-lesson training section in the manual that uses easy-to-understand screen representations and illustrations. The standard training material should be enough, but if not, there is a huge aftermarket of WordStar training materials and a lot of people out there who have used it.

WordStar uses lots of partial screen menus, but you can choose any of three levels of menu use and even turn them off if you wish. There is also on-line help with explanations of Ctrl-key combinations and dot commands.

WordStar Professional 4.0 uses function keys, but most experienced WordStar users prefer Ctrl-key combinations. These are not mnemonic, but once you've learned the basic WordStar commands they become "finger macros," in which you hold down the Ctrl key and press letters to move around the screen and manipulate your document.

Many printing-format controls are put

into documents with dot commands. If WordStar finds a period (.) in the first column of a line, it tries to interpret the information as a command.

Once you learn to use WordStar's menus, Ctrl-key combinations, and dot commands, the program is easy to use and has lots of power and features. Release 4.0 is faster than the previous versions and includes support for laser printers and several improvements of specific key commands, such as using the Del key to erase the character on which the cursor is located rather than as a destructive backspace, as in Version 3.31 and earlier.

Other improvements in Release 4.0 include an unerase command, keyboard macros, math functions, line and box drawing, LAN support, proportional spacing, programmable function keys, automatic index and table-of-contents generation, and support of a 43-line EGA mode.

The new WordStar spelling checker is a great improvement over the old and balky SpellStar. You can check a single word or part of a document while editing. The RAM-resident Word Finder thesaurus is even better and can be used with other pro-

grams, as long as Word Finder knows where to find the synonym list. The thesaurus shows lots of synonyms and is very good at matching noun-verbs, rare words, and business terms. It does less well with foreign words such as *gaffe* and *erratum* and some professional terms such as *docket*, *diocese*, and even *computer*.

Unfortunately, WordStar still lacks some of the functions that its major competitors include—and, in some cases, have offered for several years. The current release doesn't do footnotes, outlining, or sorting; it won't work with independent columns; and it won't allow you to edit more than one document at a time. •

Despite its limitations, WordStar remains an industry standard. You'll find it in most conversion utilities in other word processing programs, and the WordStar Ctrl-key editing commands, love 'em or hate 'em, are used by many other programs, such as SideKick and dBASE III Plus's Editor.

WordStar Professional 4.0, although an updated classic, still needs more features to be fully competitive. People who used past versions love it. Release 5.0, due in the first quarter of 1988, is expected to add many—if not all—of the missing functions. If it does, and if its market has not eroded so badly it can't be recaptured, WordStar could find itself back in the pack.—Bruce Brown

WordStar 2000 Plus

SUITABILITY TO TASK

Professional

Corporate

Personal

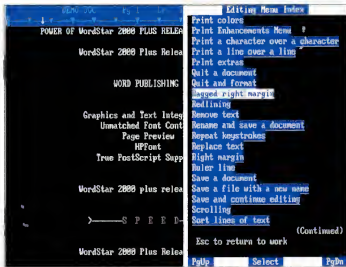
Legal

Desktop Publishing



Remember your college macroeconomics course? One popular theory: Competition benefits the consumer. Listed at \$495, WordStar 2000 Plus, Release 3.0, is a testimony to this theory. Competition has

■ WORD PROCESSORS



WordStar 2000 Plus, Release 3, accesses extensive on-line help through the F1 key. You can look up the different categories by entering the first letter. In this screen R was entered, so the cursor highlights the first R.

molded MicroPro International Corp. into a responsive organization intent on turning around the WordStar market slide.

There are certain things people hate to do: going to the dentist, explaining flagrant speeding to a police officer, and changing word processors. WordStar Professional still has a large number of loyal users, and few of those liked WordStar 2000 in its original version. But after a look at Release 3.0 of 2000 Plus, they may want to switch. Here you'll find all the same features you found in WordStar Professional, along with the ability to integrate text and graphics. What's different is the user interface. WordStar 2000 Plus uses mnemonic commands, while Professional continues to use the traditional WordStar commands. Release 3 of WordStar Professional, however, due out in February 1988, will include the features now found in 2000 Plus, as well as in the Legal and Personal editions. MicroPro says it's moving toward a product that will offer a choice of mnemonic and traditional commands.

The basic program in WordStar 2000 Plus requires 1.5MB of space (you can use floppies but must swap disks); this in-

cludes installation, program, telecommunications, help, spelling, and thesaurus files.

About 8MB of disk space would be required if you loaded the entire program—including outlining, graphics, laser fonts, printer setup data, tutorials, table-of-contents and index generators, a file-exchange program for several popular programs as well as for ASCII files, and on-screen forms generation. These functions, however, are selectively installed through WordStar 2000 Plus's easy batch installation program, which defines all of the proper subdirectories to hold the different programs. You can also deselect applications.

MicroPro likes to view WordStar 2000 Plus as a "word publisher." This package differs from a word processor, which usually does not have extended capabilities (such as graphics, telecommunications, and font control). The word publisher is also distinct from a desktop publishing program, which can produce great documents if the user has the time to learn the program and has the processing power (at least an 80286 chip) to operate it.

WORDSTAR'S PHILOSOPHY The program's word-publishing philosophy is evident in many areas: one of these is a technique called bookmarking, used to increase speed. The process forms a computer index, invisible to the user, which executes any moves from page to page, from beginning to end, or anywhere in a large document, almost instantaneously.

Style sheets inform the program about the way you want a document to appear. These information files include size of print, headers, footers, standard letterhead, and other specifications. Of course, you can create your own sheets and save them for later use. They are easily attached to the document before printing.

There are other convenience features loaded into this program. WordStar 2000 Plus can open up to three windows at one time. Windows can contain parts of one file or three separate files, but they cannot be sized.

A document summary kept on each document traces the title, author, keywords for later file retrieval and referencing, date of creation, last date modified, and total keystrokes.

You can also print while you continue to edit a file. Under this scenario, the file is spooled for printing and the corrections go into a new file. Printing cannot be queued, but documents can be chained.

As for the printed document, more than



FACT FILE



WordStar 2000 Plus,
Release 3.0
MicroPro International
Corp.
33 San Pablo Ave.
San Rafael, CA 94903
(800) 227-5609
List Price: Personal Release, \$495; Legal Release, \$595.

Requires: 384K RAM (512K recommended for graphics and companion programs), two disk drives or hard disk, DOS 2.0 or later.

In Short: A feature-packed word processor falling in-between a word processor for general applications and a desktop publishing environment. Not copy protected.

Circle 653 on Reader Service Card

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every day with
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■ Free Form

Tornado is **FREE-FORM**. It works the way you think. To start a new window you just press N, and enter information. No file names.

No extra keystrokes. To retrieve information you just press G (for Get), with any word or phrase—you'll watch **Tornado** zip through your windows like lightning linking and opening those requested. You can even flip through your windows with the arrow keys and watch them instantly pile up and lift away. These are just three of 18 easy but powerful features.

■ Space Station

Tornado is being used on the complex US Space Station project—but it does simple things too: When Harry calls you on the phone, in two seconds flat you'll display the six windows on Harry before he finishes his first sentence! No more embarrassing pauses or scrambling for information. **Tornado** is so versatile you can: write and print a letter faster than ever; track things to do; edit electronic mail; and plan a project or event—quickly and easily. You can even build a sophisticated

"knowledge" base—or an unstructured data base—without programming. And that's not all. Track phone conversations, numbers, sales leads, and all your other **RANDOM** information. With the new option you get a "Library" of windows containing: free-form calendar, project planner, grid maker, city/state/area code/time zone translator, and much more. On a portable, **Tornado** is your ideal moving office. Best of all, you tailor **Tornado** to your own needs—easily!

■ 25,000 Windows

Instead of one window or ten, imagine up to 25,000! It's like extra memory...for your brain! The uses are endless. If you can "type" it—you can "**Tornado**" it. And because it's memory resident (if you choose) you can quickly jump in from other programs—even move information between them. All this power, yet reviewers agree you

"Excellent Excellent Excellent Excellent"
PC World, Patrick Marshall

"one of the niftiest ... programs I've ever seen."
BYTE, Jerry Pournelle

"Excellent value"
InfoWorld, Review Board

"Editor's Choice"
PC Magazine

"simple — superfast"
New York Times, Diment

can start "**Tornado-ing**" in 15 minutes—not 15 days. And that's a pretty good deal since **Tornado** can save you an hour every day!

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Special features: **FEATURES:** free-form & predefined windows, scrolling within window, import & export to files & screens, cut & paste, auto word wrap, time & date stamp, move & join & dup windows, mono or selectable color, definable hot-key or non-resident, unloadable, LAN support, context help, extended ASCII, smart fully adjustable windows, parallel text processing, progressive resolution and "and-or-not" like searching without keywords, and more. **COMPATIBILITY:** IBM-PC/XT/AT/PS2 and compatibles; mono, CGA, 80 col EGA, and Hercules displays; 60K minimum RAM; 3.5" disk on request. **CAPACITY:** Up to 500 windows per file - 50 files. Not copy protected.

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MC MICRO LOGIC

Dept. T81, 100 2nd St., POB 174
Hackensack, New Jersey 07602

■ WORD PROCESSORS

430 printers are supported in the setup menu; you can edit the printer definitions or create new ones. Then, before printing, you can request a page preview to view how the type will appear on the page. This preview is displayed one page at a time. However, unless you have an EGA monitor or better, the screen printing is too tiny to read, but at least the page formatting is visible. It would be nice if there were a zoom function to enlarge parts of the screen.

The program supports both PostScript and HP-font formats. The user can access the soft, cartridge, and internal fonts of the HP and open up to 32 fonts within one document. As the fonts are changed, *WordStar 2000 Plus* automatically reformats, and the ruler line changes.

GRAPHICS EASILY IMPORTED Graphics are supported, and a graph can be imported from any program that writes a graph to disk. Also, a graphics program is included with *WordStar 2000 Plus*. This program can generate or modify graphs created elsewhere (modifications include adding boxes, legends, pointer lines, and text). It also supports a mouse.

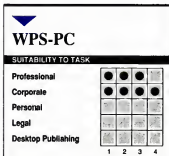
There is a library of clip art as well. In fact, if you are a purist, editing can be done pixel by pixel. After the graph is imported to the document, the text automatically reformats around the graph. Graphs can be sized.

The database included within the program is an extension of the mail-merge function. It is not fancy, nor is it relational. However, it is more than adequate for mailing-list and other flat-file requirements.

But what good is a product without being backed up by a stable manufacturer and reliable support? MicroPro has always been one of the big players in the microcomputer word-processing environment, and all indications show that it will remain firmly entrenched in this market. Its support program is outstanding. Sometimes manufacturers offer free support, but only if you pay for the phone call. *WordStar 2000 Plus* goes one step further: support is free—and so is the 800-line call. How quickly you'll be able to get your answers remains to be seen, but if MicroPro handles its support as it does its products, then

you can expect first-class service.

WordStar 2000 Plus, Release 3.0, is not for everyone. It is a full-powered word publisher, caught in-between the general word processors and the desktop publishing packages. If you are looking for something less than a desktop environment but desire more bells and whistles than a general word processor, this program is the right choice.—Wayne Harding



Conventional PC word processors do not prepare you for *WPS-PC*, from Exceptional Business Solutions—a word processor that has few similarities to other programs. This \$275 package, released in June, is designed for users who have experience with the DEC family of Gold-key word processors and would rather fight than switch. *WPS-PC* emulates such word processors as the DECmate *WPS-8* and the VAX *WPS-Plus*.

The first step in installation is to stick tiny gold and green tags on the front of certain keys to indicate their purpose. The NumLock key is known as the Gold key. Like the PC's Alt key, the Gold key is used in combination with other keys for a variety of purposes. Gold-M, for instance, brings up *WPS*'s main menu. There is a method behind this madness: *WPS* tries to emulate the layout of VT-220-type keyboards so that experienced users will have little difficulty adjusting.

WPS does not believe that the user should have to understand how DOS filenames work. Document names may be up to 70 characters long and can include blanks and punctuation. A document might be named "Letter to Carol about

dinner"; although such names are useful within the program, the trade-off is that you cannot use DOS commands to manipulate files once you exit *WPS-PC*.

SAYS NO TO DOS The *WPS* manual warns, "Do not use the DOS COPY command to move files from one diskette to another." And, of course, neither the DOS DIR command nor the TYPE command can help determine the contents of a file. *WPS* has its own commands to manage documents, which include I for indexing (the equivalent of DIR), D for deleting, RD for renaming, and CD for converting documents to more-familiar formats.

There are several caveats regarding file management. If the disk becomes full while you are editing a document, you may lose all your work. If a single document uses more than one-third of the available disk space, you can't edit it. Because *WPS* has its own special format, you can't use spelling checkers, thesauri, or other DOS programs on its documents.

Once you've created a document, you enter text as you would with most other word processors, with some differences. *WPS* is always in insert mode; there is no overstrike mode, so corrections are made with the backspace key. The Del key does not delete. Although this is disconcerting for experienced PC users, it's quite natural for DEC users.



FACT FILE



WPS-PC, Version 2.0
Exceptional Business
Solutions, Inc.
10811 Washington
Blvd., #240
Culver City, CA 90230
(213) 558-3435
List Price: \$275

Requires: 128K RAM, two disk drives, DOS 2.1 or later.

In Short: A specialty word processor that will appeal primarily to those who are already familiar with the DEC family of word processors. *WPS* is less powerful than many programs designed specifically for the PC, but it does maintain compatibility with the DEC/VAX line. Not copy protected.

CIRCLE 660 ON READER SERVICE CARD

The DAISYWHEEL makes points, the OKIDATA LASER drives them home.

August 29, 1987

U.S. Patent Office
1640 Pennsylvania Avenue
Washington, D.C. 20503

Sir,

Based on the accompanying documents, I formally request a patent for the manufacture, sale and licensing of "Food for Thought," a series of edible, educational "snackines" for children printed on sheets of dried fruit. Below, please find a complete chronological diary of the inception, development, and testing of this product:

- July 14, 1986 - Observed neighbor's son chewing on children's book; after talking with neighbor, discovered that he had never seen or heard of an edible children's book.
- August 1, 1986 - Surveyed market to see what is available in the way of edible books of any sort; found out that there is no such category in either book stores or food stores.
- August 29, 1986 - Produced prototype, working name "Fruit-Books"; used food coloring to write text; some blurring problems, worked on consistency of dye.
- October 1, 1986 - Results of first laboratory test encouraging; new formula had no effect on taste, texture or nutritional value of fruit.
- October 10, 1986 - Sent samples for Food and Drug Administration approval; also sent samples to independent laboratory for further testing.
- October 15, 1986 - Independent laboratory testing successfully; entire process had no ill effects on the dried fruit "paper".
- October 21, 1986 - Delivered samples to marketing consultant in preparation for opening meeting.
- December 10, 1986 - Met with marketing consultant; estimated sales potential in the high seven figures for the first year; left an agreement with payment options.
- December 15, 1986 - Contacted three package design firms; mailed existing materials, samples, and confidentiality agreement.
- December 27, 1986 - One design firm called and backed out of project; cited potential conflict with educational book group client.
- December 29, 1986 - Officially changed name of product to "Food for Thought."

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Crawford, McFarland & Heckler

Attorneys at Law

2801 Sanson Street Philadelphia PA 19132 • (215) 555-7284

U.S. Patent Office
1640 Pennsylvania Avenue
Washington, D.C. 20503

September 7, 1987

Dear Sirs,

With the attached notes and drawings as background, I am officially seeking a patent for the manufacture, sale and licensing of the product "SMART SNACKS," the edible "books" that help kids grow intellectually and physically.

"SMART SNACKS" are children's stories printed on pages of dried fruit, so a child can eat one after he or she reads one.

My client conceived, developed and tested this unique product between January 2, 1985 and December 26, 1986. The chronological details are contained elsewhere in this document. The timeline for the process is presented here:

- Jan 2, 1985 - Initial idea; first attempts at printing story.
- Jan 22 - Refinement formula for dried fruit. Shaved for food processing plant.
- Feb 15 - Researched market - no direct competition.
- Feb 21 - Registered letter in safe; contacted children, teens, kids, women, females.
- Mar 27 - Sent samples to Food & Drug Admin. for tests.
- Sep 18, 1986 - Safety tests initiated; literature research started.
- Sep 26 - Registered name and trademark for product: "SMART SNACKS."
- Oct 11 - Financial backing obtained.
- Oct 26 - Safety test results back; package design approved.
- Nov 17 - Market research results back; literature coverage obtained.
- Dec 9 - Contacted patent attorney; met with letters of agencies.
- Dec 11 - Delivered samples & documentation to attorney.
- Dec 27 - Presentation to Board of Directors and Officers of Parents.

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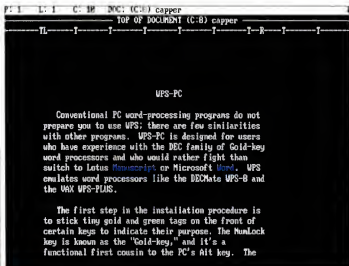
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San Francisco, CA 94107 • (415) 541-0222
*Please add \$5.00 shipping/handling. © 1987

■ WORD PROCESSORS



Conventional PC word-processing programs do not prepare you to use WPS; there are few similarities with other programs. WPS-PC is designed for users who have experience with the DEC family of Gold-key word processors and who would rather fight than switch to Lotus Manuscript or Microsoft Word. WPS emulates word processors like the DECmate WPS-B and the VAX WPS-PLUS.

The first step in the installation procedure is to stick tiny gold and green tags on the front of certain keys to indicate their purpose. The NumLock key is known as the "Gold-key," and it's a functional first cousin to the PC's Alt key. The

Underlined text appears as blue in a WPS-PC document; the ruler line at the top of the screen allows margins and tabs to be set visually.

Moving from the first page to the last is painfully slow because WPS formats each page as it churns to the end of the document. It took more than a minute to go from the first to the last screen of *PC Magazine's* 1,400-line test file.

WPS's most powerful feature is its mail-merge option. The program can generate letters, mailing lists, labels, and even reports from three mail-merge documents (files). The form document contains the text with variables like name, address, and city embedded in the proper places. The list document is the list of the information to be inserted in the form document. The selection document describes which records in the list document are to be used, based on any of six conditions or rules.

The library document is one of WPS's more powerful features. You can store short, boilerplate messages—names, introductions, closings—in this special document and then insert them in your text with a few keystrokes. If you store "Washington, D.C." in the library under the name "dc", you would retrieve and insert it by pressing the Gold-Library key (NumLock-L) and typing "dc".

The built-in communications program

is useful; it allows you to send documents in DX, AX, and CX protocols to PDP-11, VAX, and DEC computers. However, you can't use this program for PC-to-PC transmissions.

WPS has a built-in spelling checker with a 60,000-word permanent dictionary

**WPS has a built-in
spelling checker with a
60,000-word permanent
dictionary.**

and a personal dictionary. The spelling checker does not suggest correct spellings. Although it worked fine on this review, it crashed to DOS when processing the *PC Magazine* test file, which was full of unique words. The company attributed this problem to a bug that it has now identified and fixed, but documents that contain more than 2,000 unique words must still be broken into pieces.

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Reference Software
Inc.

330 Townsend St., Suite 111, San Francisco, CA 94102 (415) 542-6222

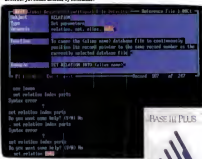
* Database up to 30 million records. Index on every field. dBASE records linked. Variable length fields. Conditional search and search criteria help and more. Imports dBASE, dIF (Lotus 1-2-3), and SDF (PFS). File directly. Reference Software, Reference File, and Ref-File are trademarks of Reference Software, Inc. Other brand and product names are trademarks of their respective holders.



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WORD PROCESSORS

We've all known children that only a mother could love; the WPS-PC word processor is surely the software equivalent of those tykes. I can't love it, but if you are a DEC user, WPS may be your baby.

—Donald Trivette



Write Now

SUITABILITY TO TASK

| | | | | |
|--------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Professional | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Corporate | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Personal | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Legal | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Desktop Publishing | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

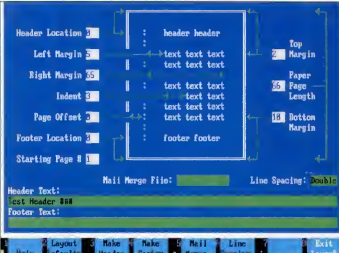
1 2 3 4

Write Now Version 1.61 is certainly one of the friendliest word processors around, ready to aid the computer-shy and the infrequent computer user with step-by-step guidelines, explanations, and helpful hints. If you are a poor speller, you are in for even more good news: the \$150 program from Ainus will suggest words, com-

In Version 2.0, Write Now's maximum document width will become unlimited.

plete your half-finished words, and save you from your own lexically muddled self by prohibiting misspellings.

Its array of spelling tools, based on a 35,000-word dictionary, is Write Now's greatest asset. (If you have limited RAM, you can select a smaller dictionary.) You can also create alternative dictionaries simply by entering the new dictionary's name on the Get Dictionary menu. You add words to the new dictionary by first typing the word, then pressing the appropriate function key.



Write Now's Page Layout menu visually aids you in formatting the page and makes it clear that the headers and footers are embedded within the top and bottom margins.

Write Now does not permit you to combine individual dictionaries, however, nor can it add more than one word at a time to a dictionary.

The program's first line of defense against bad spelling is the automatic spelling checker, which marks misspelled words by displaying them in inverse video as you type them. Write Now will also simultaneously signal your errors by beeping, providing cues that are at once visual and aural.

SECOND-GUESSING THE TYPIST

The Spelling Suggestions tool can help out those who are prone to malapropisms, such as using *suggestive* when they mean *suggestible*. As soon as Suggestions has seen enough letters of a word it considers complex, it opens a window showing that portion of the dictionary that contains similar words.

You scroll down the list until your selection is highlighted in inverse video, and then press Enter to place the word into your document. You can also ask for suggestions at any time by pressing Ctrl-Enter. If the cursor is on a space, the window will display the dictionary, starting at the be-

ginning with a, then *aardvark*.

The Clairvoyance spelling aid goes Suggestions one better by actually completing words for you. Clairvoyance attempts to recognize the word as you type it, narrows the possibilities, and only completes the word when it believes it has correctly recognized it. This feature, for in-



FACT FILE



**Write Now,
Version 1.61**
Ainus Inc.
10200 SW Nimbus
Ave., Suite G-5
Portland, OR 97223
(503) 620-7000
List Price: \$150

Requires: 384K RAM, one disk drive, DOS 2.0 or later.
In Short: Easy-to-learn, menu-driven program that comes with an array of spelling tools, including the ability to create your half-spelled words. Good for occasional users and people needing assistance with typing. Not copy protected.
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PC-4501

PC-4502

PC-4521

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CIRCLE 139 ON READER SERVICE CARD

■ WORD PROCESSORS

stance, completed *length* for me, but made me type every single letter of *complexity*.

Both Suggestions and Clairvoyance would be enhanced if the user were able to set the level of difficulty above which the tools are operative. Clairvoyance can be a little too eager to help, such as when it completes a word differently from what you intended. Whenever I tried to type *suggestion*, it jumped in and typed *suggested*, forcing me to retype the final letters.

Since Clairvoyance completes a word at the same time that you are typing it, you will often find your next letters appended to the end of the automatically completed word, resulting in words that are not in any dictionary, such as *clairvoyancevoynance*. This can be avoided by using Clairvoyance in combination with *Write Now's* ultimate weapon, SpelGuard.

If you misspell a word that is in the dictionary, SpelGuard stops the cursor in its

tracks and will not let you continue until you correct the word, add the word to the dictionary or turn off the feature.

HELPFUL MENU CHOICES While *Write Now's* spelling tools are its main attraction, the package is also characterized by its friendliness. The menu selections, which are function key driven, are strung out in boxes along the bottom of the screen. When you make a selection, a window often pops up in the document portion of the screen.

In the case of functions that require typed input, such as the search-and-replace menu or the insert-file menu, the windows explain what is required and provide the input space. Other windows offer suggestions on how to proceed; when you toggle the function key to turn on the spelling checker, the window informs you that "Spelling will be checked on all typing and retrieved files." The menu chain can

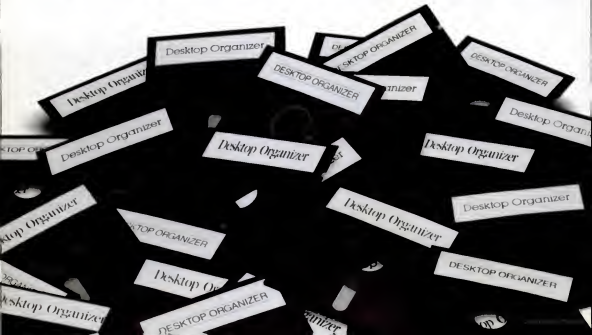
be bypassed in many cases by using *WordStar*-like Ctrl- and Alt-key/letter combinations.

The most impressive of the menus is the highly visual Page Layout menu. It displays a mock-up of a page with arrows pointing to the header and footer portions, to the margins, and to the indent and page offset areas. A useful addition would be to allow temporary page layouts for the current session, as well as page layouts related to specific documents.

Another helpful modification would be to add a feature that can boldface and underline while the document is being typed rather than only after the fact. Ctrl-key/letter combinations for deleting sentences and paragraphs would be a worthwhile addition; right now this must be done with the cut-and-paste menu.

Beyond these quibbles, the one area of *Write Now* that doesn't measure up to its high standard of helpfulness is the manual.

50 DESKTOP ORGANIZERS.



It is filled with good information, but it needs to be redesigned to present the information more visually.

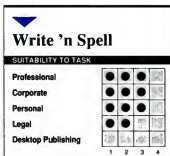
Since the program's debut, several groups—including the California school system—have asked Airus to incorporate changes that would make the product more accessible to disabled users. These enhancements, along with others, are included in Version 2.0 of *Write Now*, which should be on the market by the time this review appears.

In Version 2.0, the maximum document width will be increased from 80 columns to unlimited, though the right margin used in formatting is constrained to 250 columns. Documents can also be formatted with multiline headers and footers.

But even the earlier version of *Write Now* is useful for anyone who wants to get some work done without having to relearn his word processor's language—a good choice for business professionals, other

occasional users, and people needing assistance with typing.

—Stephanie Stallings



Write 'n Spell, from Professional Software, is not flashy. Home users and small business owners who have no need for in-

dustrial-strength word processing should be pleased with this \$129 program. It's a good example of the fundamental law of computing: a product's ease of use is inversely proportional to its number of features.

Write 'n Spell doesn't have such features as a thesaurus, a built-in calculator, or windowing, but it will do a good job of turning out routine correspondence, reports, and similar items.

INTUITIVE PRODUCT *Write 'n Spell* is intuitive. A menu line across the top of the screen displays seven commands associated with the function keys; pressing Ctrl brings up seven different ones; pressing Alt, six more. It took only a few seconds of experimentation to learn that boldface and underlining are operated by toggling function keys. Press F3 to start boldfacing (or F4 for underlining); press the same key again, and you are back to roman type.

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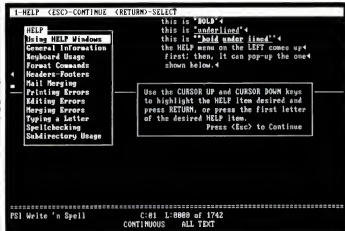
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WORD PROCESSORS



Write 'n Spell incorporates WYSIWYG boldface and underlining. On-line help windows containing bare-bones information pop up quickly and easily.

Special symbols appear on-screen before and after the text that is boldfaced or underlined; thus you can easily cancel those features by deleting the symbols.

The information line across the top of the screen indicates that F1 is the help key. When you press it, a small window listing a "table of contents" for help features pops up. Highlight the subject you're in-

terested in, press Return, and another small window pops up. On-screen help could be more comprehensive, but it's not bad as it stands.

Hitting the Esc key will cancel almost any command you've just entered. That should be a big help to anyone who sometimes gets partway into an operation and doesn't know how to proceed.

POTENTIAL DRAWBACKS Write 'n Spell does have three potential drawbacks. Its worst problem is that you cannot customize its screen display. The screen is set for 80 columns; you can't for instance set a right-hand margin at column 65 and have the program word-wrap there—so if you don't like that, tough. You can format output any way you wish, though, via embedded formatting commands. There's also a preview (print-to-screen) feature.

Second, the manual is inadequately indexed, although it's comprehensive and clearly written. The index is only 6 pages long and omits many of the terms a new user might be looking for (*save, revise, import, export, translate, and word count*, among others).

Third, to create conventional ASCII files, you must first change the printer specification, then "print" to disk. This is

not a major pain, but it's inelegant, annoying, and certainly odd for a product first introduced in 1985.

Balancing these defects, changing printers involves a fairly quick process: you invoke a separate program called SETUP that's easy to use, though it is an extra step. One way to make this process more graceful would be to create separate Write 'n Spell program disks—one for printing to disk, and one for each type of printer used.

According to the vendor, a new version of Write 'n Spell with more features will be available by the time this review goes to press. Those features will include a screen display that the user can customize, a thesaurus, a new dictionary, definable function keys, and more commands. Users of the current version will be able to upgrade for a modest (under-\$100) amount. The current version will still be supported.

Write 'n Spell does not have an extensive command list. But with a bit of creativity and the program's embedded formatting commands, it can be made to do most things beginning users need.

—Howard A. Karten

XyWrite III Plus

SUITABILITY TO TASK

| | |
|--------------------|-----------|
| Professional | ● ● ● ● ● |
| Corporate | ● ● ● ● ● |
| Personal | ● ● ● ● ● |
| Legal | ● ● ● ● ● |
| Desktop Publishing | ● ● ● ● ● |

1 2 3 4

XyWrite has maintained an enviable reputation for speed and flexibility. It has gained a following of ardent devotees, particularly in the field of publishing, where its pure ASCII-file format gives it a decided edge in exporting text to typesetting systems. But it's also known for being difficult to learn, and the number of XyWrite aficionados is relatively small.

XyQuest has improved the documentation with each successive version of Xy-



FACT FILE



Write 'n Spell
Professional
Software Inc.
51 Fremont St.
Needham, MA 02194
(617) 444-5224
List Price: \$129
Requires: 256K RAM,
one disk drive, DOS 2.0 or later.

In Short: This is a straightforward word processor—not rich in features, but one that does not require you to undergo elaborate training or study to begin doing productive work. Professional word processor users will probably find it too simple and underpowered, but others may find it meets their needs. Not copy protected.

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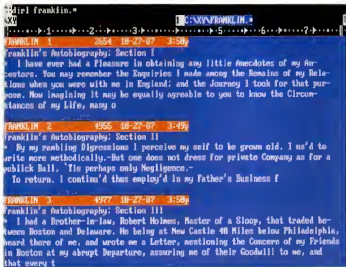
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CIRCLE 486 ON READER SERVICE CARD

■ WORD PROCESSORS



XyWrite III Plus lets you display the first few lines of each file when you call up a directory. Here the first line of each file is a hidden, nonprinting note.

Write. Now, with Version 3.52, released in June 1987, mastering the program's features is no longer the ordeal it was in earlier years. Three tutorial books and its extensive, well-organized on-line help service also make the learning process easier.

Still, the program's almost entirely command-driven structure means that becoming a proficient user requires a good deal of thumbing through the manual. Once you've learned the program, you'll find the effort was worthwhile: XyWrite's concise mnemonic commands give you quick access to a more versatile set of functions than do most menu systems.

EDITING POWER XyWrite III Plus, priced at \$445, offers all the editing capabilities you'd expect from a high-end word processor, and then some. Moving and copying large blocks of text—and automatic reformatting and rehyphenation—are nearly instantaneous. The speedy search-and-replace function lets you change embedded formatting commands. To facilitate working with multiple files, the program can open up to nine windows at a time—each on a separate full screen or on a divided screen with other

windows—and you can copy or move text among them.

The program isn't WYSIWYG, but a Type command shows you how your document will look when it's printed out with page numbers, headers, footers, and footnotes in place.

XyWrite III Plus is all you need for simple desktop publishing. It can create and print text in independent or snaking columns with whatever justification you specify. You have the option of specifying different formats for odd- and even-numbered pages. Style sheets let you switch easily among a number of complex styles. You can even insert into your documents printer-ready files created by any spreadsheet or graphics program. Other powerful features automatically generate indexes and tables of contents in a variety of formats.

The program includes a well-implemented mail-merge facility, a forms-creating mode, outline numbering, and an on-screen math capability. Those who must keep track of large numbers of documents can display the first few lines of every file when they call up a directory.


XyWrite III Plus offers excellent printer

support and lets you take advantage of the full range of features offered by popular laser printers. The program comes with 91 printer drivers, and more than 65 others are available free from XyQuest. And if you can't find what you want, you can customize the driver.


In fact, you can customize nearly every facet of XyWrite's operation. There's no better way to make often-performed chores fast and easy than by taking advantage of this capability. You can change the default settings of everything from the type of underlining (words only or words and spaces) to the order in which directories are sorted, and you can make the new defaults permanent by adding commands to a file called STARTUP.INT, which is XyWrite's equivalent of the DOS AUTO-EXEC.BAT file.

XyWrite offers a powerful macro capability that lets you perform complex procedures automatically at the touch of a key. A macro key can hold any block of text, any recorded sequence of keystrokes, or a program written with a built-in programming language that allows the use of labels, variables, and conditional branching. You can also reassign the function of any key on the keyboard. You can even create your own help screens and menus.

QUICK SPELLING CHECKER The most prominent new features in XyWrite III Plus are the spelling checker and the-


EDITOR'S CHOICE

FACT FILE



XyWrite III Plus,
Version 3.52
XyQuest Inc.
44 Manning Rd.
Billerica, MA 01821
(617) 671-0888
List Price: \$445
Requires: 384K RAM
(256K without spelling checker), two disk
drives (hard disk recommended), DOS 2.0 or
later.

In Short: This powerful program may be the
fastest around, and it has an encyclopedic
range of features. Yet its entirely command-
based interface makes it somewhat difficult to
learn. Not copy protected.

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■ WORD PROCESSORS

saurs. The spelling checker zips through your documents at breakneck speed and gives you just about every imaginable option for making corrections. You can check files on disk and have *XyWrite* compile an alphabetical list of questionable words. *XyWrite* can then automatically replace the incorrect words with corrections you append to the list.

With a file on-screen, you can check just the word at the cursor or the entire file. Each questionable word activates a pop-up menu that presents you with suggested alternatives, which you can automatically substitute for the flagged word. Another option is adding the word to a user dictionary, which you can edit manually. You can engage an auto-correction feature to beep at you whenever you make a mistake. There's even an auto-replace feature that will automatically spell out abbreviations.

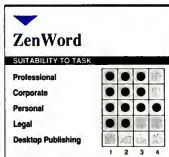
The built-in thesaurus isn't as slick, but it's good nonetheless. Pressing **Ctrl-T** pops up a list of synonyms for the word under the cursor, and you can automatically replace that word with one of the alternatives—though this feature does not retain the original tenses or plural forms. You can also look up synonyms for any word in the synonym display or for any word you type in.

XyWrite III Plus adds a red-lining feature that works like a charm to give you a visual record of your revisions. With the red-lining mode on, all deletions appear in boldface, and all insertions are marked in reverse mode—even those made by the move command, the spelling checker feature, or the search-and-replace utility. You then have the option of restoring the document to its original form or permanently incorporating the revisions, which can be done almost instantaneously with a moderate-sized file.

Other welcome new features include a sort function for alphabetizing lists, a quick word-count function, and a capability for affixing hidden notes to a document. *XyWrite III Plus* is also friendlier to TSRs than *XyWrite III* was, and *SideKick*, Version 1.5, can now paste text directly into a *XyWrite* screen.

If you want a word processor that can do just about everything but wash your socks, check out *XyWrite III Plus*. Its tremendous speed and range of features make

it a winner for working with even the largest, most complex documents. Other programs may be easier to learn, but *XyWrite*'s command structure is so logical and consistent that once you get the hang of it, the program's a pleasure to work with.—Robert Kendall

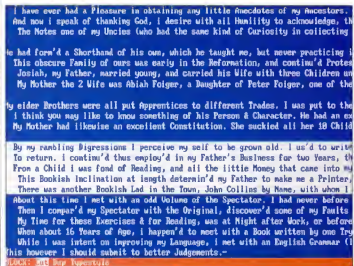


As its name implies, *ZenWord*, Version 2.14, is an intuitive, inexpensive word processor. Accessible to novices, it should also appeal to the experienced user. Although this \$39.95 program, released last

April by Knowledge Engineering, lacks some of the more-sophisticated capabilities such as indexing, most writers will find *ZenWord* equal to their needs. You'll find support for a number of foreign-language and mathematical symbols, even if you don't find equation-solving capabilities. And you'll be intrigued by its ability to watch your writing style and mimic some of your habits.

Just load *ZenWord*, and you're ready to work. Strike **Esc**, and a menu of Lotus-style command categories appears at the bottom of the screen. You select a command by moving the cursor with the Spacebar or by striking the first letter. You'll then see a second level of commands, also selected by the Spacebar or first letter. Pressing **Esc** and a question mark brings up context-sensitive on-line help, which is complete enough to guide you without the manual. The help function can be reassigned to a single key, but the help won't be context sensitive.

ZenWord enables you to customize the configuration to fit your specific needs. The manual even suggests that you make several backup disks, each one customized to a specific use. For example, you could



Once a block is highlighted in *ZenWord*, you can do just about anything with it, from a simple cut-and-paste operation to moving to an entirely different file.

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SYSTEM REQUIREMENTS: IBM™ PC, XT, AT, PS/2, or compatible. Two disk drives, or hard disk. MS/DOS 2.0 or greater. 256K minimum.

* File manager (Copy/delete, Rename, Menu Print, Etc.), appointment book/calendar, fully automatic Rolodex™-type card file system (with autodialer and labelmaker), virtual memory text editor word processor (edit up to 10 files at once), ASCII table, alarm package and clock, five calculators, printer redirect, speed key, cut and paste, clipboard, notepad, screensaver, security keyboard lock, system reset, DOS command line editor, hex editor, directory editor, disk optimizer, graphic directory display, directory sort, file directory, file locator, undelete, format recovery, and more.

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EDITOR'S CHOICE

- Microsoft Word 4.0
- Nota Bene 3.0
- Q&A Write 1.0
- WordPerfect 4.2
- XyWrite III Plus 3.52

Plus ça change, plus c'est la même chose: *The more things change, the more they stay the same.*

Nearly every program has changed significantly in the 2 years since PC Magazine's last word-processing blockbuster, yet three of the winners are repeaters: Microsoft Word 4.0, WordPerfect 4.2, and XyWrite III Plus 3.52. New are XyWrite's cousin, Nota Bene 3.0, and Q&A Write 1.0.

Programs weren't locked into any one category, but were tested for suitability as professional, corporate, desktop publishing, legal, and personal word processors. The best programs in one category were generally well suited in other categories, despite the different requirements.

Professional: Microsoft Word, Nota Bene, WordPerfect, XyWrite III Plus. Microsoft Word and WordPerfect offer a wealth of features, and exceptional flexibility. Word's style sheets make document formatting a breeze. Also, nobody puts a mouse to better use than Microsoft—if you want to use a mouse—and Version 4.0 is finally fast enough to run on a 4.77-MHz PC. WordPerfect has no serious weaknesses and offers the industry's best support. But if all-round speed and the ability to swallow massive documents without a hitch are important, nothing can touch XyWrite III Plus and Nota Bene. If there's a feature—any feature—you've wished for, these two probably have it. The one dark cloud on XyWrite's horizon is the question of whether

this small company has the desire to keep pace with the industry and build a better user interface. Nota Bene, built around XyWrite, has a better user interface and offers features geared to academic use, such as text retrieval.

What about the rest of the pack? Watching WordStar Professional's decline (the world changed: MicroPro didn't) has been like watching an old friend slip into senility. Its biggest saving grace: most PC veterans cut their teeth on WordStar 3.3, so help is always nearby. If a novice calls down the hall asking, "How do you mark a block?" a dozen voices chorus back, "Ctrl-KB. Obviously."

Corporate: Microsoft Word, WordPerfect. "Corporate" refers to the features needed for a corporate word-processing pool or that an executive secretary might require: document summaries, mailing list management, DCA conversion. It doesn't mean software that would suit everyone (professionals and analysts within a corporation need professional word processors, and the big boss may want not the biggest but the simplest personal word processor).

WordPerfect and Microsoft Word have the best mix of corporate features. WordStar 2000 Plus is markedly improved from its earlier versions and merits an honorable mention.

MultiMate Advantage, an editor's choice 2 years ago, hasn't kept pace with the times. Its Wang-like interface doesn't matter as much now (if you must have it, consider OfficeWriter). Ditto for DisplayWrite 4 now that the standalone DisplayWriter is extinct. And few companies really do buy DisplayWrite just to have the same program on

PCs, minis, and mainframes. So why does it sell so well? Could be those magic letters I-B-M.

Desktop publishing: Microsoft Word, Nota Bene, WordPerfect, XyWrite III Plus. DTP covers two areas: the first, driving a laser printer directly, where the word processor is the desktop publishing system and you're mixing headlines, multi-column body copy, and possibly graphics; the second, as a front end for PageMaker or Ventura Publisher. Microsoft Word can't be beat for directly driving laser printers: its automatic softfont downloading is effortless, and Version 4 lets you toggle between the near-WYSIWYG graphics mode and the faster character mode. XyWrite and Nota Bene do just as well formatting laser output, and if you're involved in typesetting and commercial publishing, XyWrite and Nota Bene have what you want. Everything you see in PC Magazine was written or edited in XyWrite.

As a front end for DTP programs, WordPerfect proves as good as the others, but its support for proportional laser printer fonts is mediocre. That should change in Version 5.0, available by spring.

Microsoft Windows Write is slow if you don't have an AT, but it's truly WYSIWYG and deserves consideration. Its ability to merge graphics and data from other Windows applications makes it a good choice for DTP on a shoestring.

Legal: Microsoft Word, WordPerfect. Take your pick. Both are well equipped, with red-lining, document comparison, line numbering, and citation checking. WordStar 2000 Plus, an honorable mention, will be competitive once it ships the legal edition, which wasn't available for review. Recognition

also goes to Samina Plus IV, which has American Bar Association approval but a too-high price tag (\$695).

Personal: Q&A Write.

PFS:Write defined this market. Now it belongs to Symantec's Q&A Write, which is PFS-like in its operation and interface. Don't be put off by the "personal" moniker in this category: Q&A Write does sophisticated laser-printer formatting. Q&A, the database, has a writing module that's similar to Q&A Write; for some people, that may be all they need.

PFS:Professional Write is built on the original PFS:Write, which was stellar in its time. Write's best features continue in Professional Write: the on-screen-sheet-of-paper metaphor and its ease of use. If you think you simply must have the original PFS:Write (count to 10 and the thought will pass), IBM's Display-Write Assistant is based on Write. Webster's NewWorld Writer I is a good program with a few quirks and the best manual—bar none—for casual, nonprofessional writers: half the manual explains the elements of good writing style.

PC Magazine will review under-\$200 integrated programs (word processor, spreadsheet, database, usually graphics and communications) in the next issue.

We'd like to offer an editor's choice for a PC-based dirt-cheap, ultra-simple personal word processor that's no more complex than the non-DOS all-in-one key-board/CRT/primer machines like the Magnavox Videowriter. But nothing offers markedly greater simplicity without giving up too much functionality. Best bet: add a batch file that loads Q&A Write or PFS:Professional Write on boot-up.

set up one format for nondocument work without insertion or word wrap, and another for text processing, for which wrap and different margins would be preferable. You can justify text with a simple command.

You can change each feature of the screen display and format, including color setting, through the menu. If the setup is for a specific file, it will be saved with the file when written to disk, but if you want to keep the configuration as a default, you can write it to the overlay file.

The **Appear/Draw** command (Esc-A-D) accesses a table of foreign characters, line- or box-drawing symbols, and mathematical symbols. You must only place the cursor over the desired figure and strike Enter to insert it into your text. This may not be as fast as having keys assigned to specific characters, but it eliminates the task of trying to remember where you assigned characters.

SMART STYLING The program offers an option to get rid of all those extra spaces in a paragraph that can make reformatting frustrating. This function automatically inserts a single space between words and two spaces after periods, and it's smart enough to leave single spaces after periods if it sees that that's how you do it. Watch out, though—with this option, if you don't leave a blank line between paragraphs, **ZenWord** will run the text together as a single paragraph.

To delete a section of text, you highlight it by moving the cursor—using the Cursor Up and Down keys to mark several lines at once—and then use the Cut command. You can also delete a line with a single command. A function called Dup highlights a section of text and then lets you paste it either elsewhere in the file or in another file. **ZenWord** also features data-sharing mechanisms to move text from **ZenWord** to other Knowledge Engineering programs, including **ZenCalc** and **ZenFile**.

ZenWord's search-and-replace function does global changes, but it also lets you choose whether to make changes by stopping at each instance of the string. You can use the search function to position the cursor at a specific line or page number.

The program's procedure for setting up macros is simple. By selecting the Macro



FACT FILE



ZenWord, Version 2.14

Knowledge Engineering Inc.
1439 Circle Ridge
Austin, TX 78746
(512) 328-0100

List Price: \$39.95

Requires: 128K RAM,

one disk drive, DOS 2.0 or later.

In Short: Inexpensive and intuitive, this program has the unusual ability to watch your writing style and mimic some of your writing habits. Not copy protected.

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command on the menu, you can assign a series of keystrokes to the ten function keys at the left of the keyboard. It is just as easy to delete the macro by selecting Macro and immediately striking the selected function key, which is then freed for other uses.

The **ZenSpell** spelling checker first saves your document, giving you the option to change the name, and then highlights each word it doesn't recognize. You can ignore the word and proceed to the next one, change the spelling of the word, add it to the dictionary, or exit. **ZenSpell** can even be used by itself to check documents produced by other word processors. The spelling checker doesn't offer alternatives, but it is comprehensive and includes geographic names.

The manual is a slim paperback book with a detailed table of contents and an adequate index. There is also a brief interactive tutorial with parallel text included in the manual.

As intuitive as it is in most respects, **ZenWord** does have a few shortcomings. For example, it doesn't recognize a hyphen as a line break. You save a file by pressing W for Write, not S, as you would think—S is for Spell.

ZenWord strikes a balance between ease of use and availability of good features. It's an excellent choice for less-experienced users who have no need for the sophisticated features of more-complex, more-expensive programs.

—John O. Schoenbeck

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■ PC LAB NOTES: LASER PRINTERS ■ CAROLINE HALLIDAY

LEARNING TO LIVE WITH LASER PRINTERS, PART 2

Creating and downloading images, handling macros, and using PCL push and pop commands for cursor positioning will help you make fuller use of your LaserJet's capabilities.

In the last issue, I discussed several techniques for customizing the output from your laser printer that go beyond the features supported by most word processing packages. In addition, the explanation of how to use the built-in patterns and rules of the Hewlett-Packard LaserJet Plus and series II served to provide a very simple introduction to desktop publishing methods. This article will extend the range of things you can do with your laser printer, making use of many of the features previously discussed and of additional functions that are available through the Programming Control Language (PCL) of the LaserJet II.

The problems of handling fonts will be considered in the next issue, where a utility to facilitate sending Escape sequences will also appear. The LaserJet Plus and series II machines can print a wide variety of graphics images composed of a series of dots. Although the graphics capabilities of the LaserJet machines are acceptable for many applications, their 300 dot-per-inch (dpi) resolution is not as good as typeset-quality printing. Specifically, the printer resolution does not allow very good reproduction of photographs (it's not even as high as for a newspaper image), but line drawings are very adequately handled.

There are three very useful PCL commands that can help automate the process of reproducing images. The first is the macro command, which allows you to download an image (e.g., a company logo) to the printer. This image is assigned a number and can be recalled at any time so that you don't have to download it from

disk each time you need it.

The push and pop commands are the other useful commands in the command set. These can be used to save and restore the cursor position. This is particularly useful if you move the cursor by means of relative addressing (discussed in Part 1). It's tricky to keep track of the absolute po-

sition and then return to the same position when relative addressing has been used. Saving the current cursor position at a particular point and then restoring it later when required makes the data manipulation far easier.

CURSOR POSITIONING IN ACTION

Although the data files for graphics images can become large and are tedious to create, for small images (such as a company logo) it is practical to generate the data file manually on the PC. The graphic is then transferred to the printer using Escape codes. For larger images, a paint package that supports the LaserJet is very desirable. Alternatively, the principles that are used for the small image can be taken and incorporated into a program that generates the image in a more-automated fashion.

The basic principle behind creating a graphics image on the laser printer is to position the cursor and send the data for the image. The same cursor positioning commands that were shown in the first article can be used.

The cursor can be moved to a particular position on the printable page using absolute addressing by specifying the column and row desired or by specifying x and y coordinates for the cursor position in terms of the number of dots from the top-left-hand corner of the page. Remember that when using dots for cursor positioning, there are always 300 dots to the inch.

Relative positioning can be used to move the cursor a particular distance from its current position, either in terms of columns and rows or in terms of dots. The Es-

PRODUCTIVITY INDEX

PC LAB NOTES

Shortcuts and advice on generating graphics images on laser printers.

ENVIRONMENTS

OS/2's keyboard monitors watch for hotkeys and hog no interrupts.

POWER PROGRAMMING

MASM and C convert binary bits into ASCII for your viewing pleasure.

SPREADSHEET CLINIC

Trailing minus signs move out in front; strange behavior from @IRR.

USER-TO-USER

New PATHS in a hurry; clickety-clack keyboard toggling.

POWER USER

Printing IBM graphics on old Epsoms; merging dBASE data into WordPerfect.

LANGUAGES

Fast EGA screen dump in BASIC for lasers; support for unsigned integers.

PC TUTOR

Physical and logical drives; DOS VERIFY's dubious seal of approval.

CONNECTIVITY CLINIC

Linking a wide area network; LANs for software development.

■ PC LAB NOTES

cape sequences for relative addressing are the same as those for absolute addressing *except* that a direction sign (+ or -) is placed in front of the number. To position the cursor absolutely in row 4, column 6, the Escape sequence is

Esc6a6c4R

To move the cursor 2 inches to the left and 3 inches down the page relative to its current position, the Escape sequence is

Esc*p-600x+900Y

There is an additional way to move the laser printer's cursor. Its resolution is even finer than the 300 dpi that is available using the dot coordinate method. The cursor can be moved in increments of $1/720$ of an inch by using the decipoint command. The arithmetic involved in translating the position of the cursor to decipoints is not worth the trouble for many applications, but for applications such as creating a proportional font and microjustifying it, this is the resolution of choice. The Escape sequence to move the cursor .2 inch horizontally to the right and .1 inch vertically down the page using decipoints is

Esc6a+144h+72V

Absolute cursor positioning can also be used by omitting the sign in front of the x or y coordinate.

PUSH AND POP The LaserJet printer has a cursor position stack, and two PCL commands allow you to use it to save and restore the present cursor position. The current cursor position is pushed onto the stack using the push command. The last cursor position put onto the stack is removed by using the pop command. Up to 20 cursor positions can be saved on the stack at any one time. The Escape sequence to push the cursor position onto the stack is

Esc6f0S

To pop the cursor position off the top of the stack, you use

Esc6f1S

The ability to push and pop cursor locations is useful in preparing page layouts. For example, if a form consisting of various straight lines is to be generated, the

cursor position for each line does not have to be calculated. Instead, the cursor position is saved on the stack and is removed again when needed. The more you work with graphics, the more you'll come to appreciate the cursor stack.

In order to use this feature effectively, it is important to remember what happens to the cursor when functions are drawn or text is written. If an internal rule or pattern is drawn, the cursor position at the end of the command is the same as at the beginning of the command. On the other hand, if a graphics image is drawn by sending Escape sequences from the computer, the cursor position at the end of the data trans-

■ The transmission of a graphics data pattern usually cannot be done directly from a text editor.

fer will be different from its position at the beginning. If a text character is printed, the cursor is moved to the next character position after printing, and the printer responds to a CR-LF when it is sent, moving the cursor to the left margin on the next line.

GRAPHICS IMAGE PREPARATION

Four dot resolutions—75, 100, 150, and 300 dpi—are available on the HP series II. When you select one of the lower resolutions, the printer simply merges several dots together to look like one bigger square dot. This permits you to scale graphic images in a primitive fashion: as the resolution is decreased, the pattern becomes coarser because the dots are larger. In creating this effect, however, you must remember that the dot resolution setting does not affect the amount by which the cursor is moved in response to cursor-positioning Escape sequences. Cursor movements (when specified in dots) are always specified in 300 dpi increments, regardless of the graphics resolution ultimately used for printout.

Forming the dots needed to print a graphics image into a printable data pattern

is not as straightforward a process as was sending the printer commands I've described previously. The transmission of a graphics data pattern to the printer usually cannot be done directly from a text editor. This is because the information has to be in a binary format, and most text editors will not allow you to enter a binary zero for the data. The situation is worse if the binary pattern somewhere in the graphics data is the correct value for a Ctrl-Z (1Ah). In that situation, if the program is loaded into a text editor, the text editor will assume that the end of the file has been reached and will not load the rest of the file beyond the Ctrl-Z. Two methods can be used, however. The graphics data can be entered as a binary character string via a programming language, or DEBUG can be used. I'll use the latter method for illustration here.

When you send a graphics image to the printer, you're sending a stream of spaced dots whose pattern must be defined one dot at a time. Graph paper is a good idea at the initial, planning stage. Once the image has been drawn on paper, it needs to be translated into hexadecimal numbers. First turn the image so that it is oriented the way that it is to appear on the sheet of paper. Then, using the lines on the graph paper, the image is split into a series of rows and columns. If the image is to appear on a portrait page, the rows go across the short dimension of the paper, and for a landscape page the rows are parallel to the long edge of the paper.

The printer always prints graphics images as if the paper were in portrait mode. This means that if the same image is to be transferred in portrait and landscape modes two different bit patterns are needed. The diagram "Graphics Image Portrait and Landscape Bit Patterns" shows a simple image and the bit streams needed to print it in portrait and landscape modes. Note that this is a very small image. If, for experimentation, this string alone is used, remember that it is only 16 bits wide. (Since the LaserJet series II requires a whole number of bytes in each row, when you plan your image bit streams, you may have to add a few bits of white space to the right-hand edge to make a full byte, as I have done for the portrait mode rows shown in the diagram.) At 300 dpi this is almost too small to see, though at 75-dpi

resolution I suggest using below, it will plainly look like the diagram in miniature.

For the portrait mode the image is split into rows and each row is split into groups of 4 bits, starting at the top-left-hand corner. The hexadecimal equivalent of the bit pattern for each group of four is listed. This exercise must be repeated for each row of the image. The diagram "Bit Pattern-to-Hexadecimal Conversion Chart"

shows how to convert the possible bit patterns into their hexadecimal equivalents.

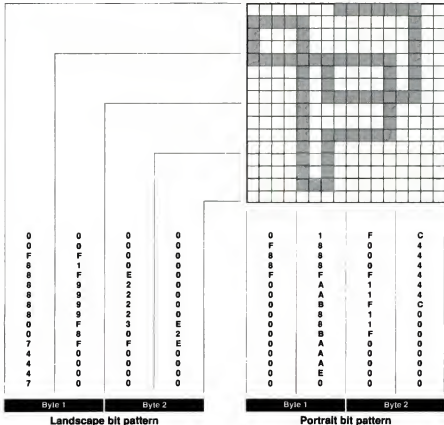
For the landscape mode, the image is turned so that it sits on the page in the desired orientation. Then turn the paper and the image together back to the portrait orientation. This image is again split into rows and columns, and the data for each row is obtained by splitting the row into groups of four from the left-hand edge and

moving to the right. The hexadecimal equivalent of the bit patterns makes up the data stream.

CREATING THE DATA FILE Once you have converted the graphics image into hexadecimal numbers, you can use the DOS DEBUG program to produce the actual binary file. The binary file created for this article includes the Escape se-

Graphics Image Portrait and Landscape Bit Patterns

The bit stream needed to print an image on a portrait page is different from that needed to print the same image on a landscape page.



■ PC LAB NOTES

quence that tells the printer how many bytes of graphics data will follow for each line of the image. This file does not include any of the other commands needed actually to *print* the image. This simplifies finding mistakes you might make while defining the image, as the graphics data is kept separate from the control codes that set up the graphics mode.

The data can be entered into DEBUG directly if you're an accurate typist. Alternatively, a text editor can be used to enter the necessary DEBUG commands and the data. Then the resulting file can be used to create the data file by using DEBUG together with the DOS redirection command.

The data string that is entered into the text editor for conversion into binary via DEBUG includes the DEBUG commands. The sequence for the small image in portrait mode shown in "Graphics Image Portrait and Landscape Bit Patterns" is shown in Figure 1.

The command `e 100` enters the successive bytes of data starting at address

```
e 100 1b 2a 62 32 57 01 FC 1b 2a 62 32 57 F8 04 1b 2a
e 110 62 32 57 08 04 1b 2a 62 32 57 08 04 1b 2a 62 32
e 120 57 FF F4 1b 2a 62 32 57 0A 14 1b 2a 62 32 57 0A
e 130 14 1b 2a 62 32 57 0B FC 1b 2a 62 32 57 08 10 1b
e 140 2a 62 32 57 08 10 1b 2a 62 32 57 0B F0 1b 2a 62
e 150 32 57 0A 00 1b 2a 62 32 57 0A 00 1b 2a 62 32 57
e 160 0A 00 1b 2a 62 32 57 0E 00
r cx
69
w
q
```

Figure 1: The data string to create the sample portrait graphics image DATAFILE.

ds:100. The following lines do the same thing at subsequent addresses. The initial sequence

```
1b 2a 62 32 57
```

is the hexadecimal equivalent of `Esc*b2W`. Each Escape sequence is followed by 2 bytes of data. The general form for the Escape sequence to send the graphics data stream to the printer is

```
Esc*b#W[Data]
```

The number symbol (#) is a variable that you replace with the number of bytes of data that are to be sent on a single row of the image. *Data* is the hexadecimal string that constitutes each row of the image. (You do not type in the square brackets shown around the word *Data*.) Each line of the image has a separate data string. Remember that if a carriage return line feed (CR-LF) is included in the graphics image, it will be included in the printed shape. To avoid this, the rows of data for the image should follow each other directly, with no CR-LF between them.

The line `rcx` causes DEBUG to display the current contents of register CX and allows you to make modifications. CX is the length of the file in bytes (hexadecimal). Thus, in this example there are six rows of 16 bytes, plus nine more on the last line, making the length of the file 69h. For different data patterns this number will obviously vary. The next line causes the file to be written, and `q` leaves DEBUG and returns to DOS.

If you have used a word processor to create the file above and named it `TEXT.S`, the DOS command that you then use to convert the text file `TEXT.S` into a

binary data file named `DATAFILE` is
DEBUG DATAFILE <TEXT.S

PRINTER SETUP To transfer the image to the printer, you begin by changing the page orientation (if necessary) and by setting the resolution desired. To change the resolution for graphics images to 75 dpi, you would use the following Escape sequence:

```
Esc*t75R
```

For 100 dpi, just replace the 75 in the Escape sequence with 100. Similarly, the other resolutions of 150 and 300 dpi can be obtained by substitution.

There are two different ways to begin graphics mode, for you can define the left-hand margin for the graphics image either as the left-hand margin of the graphics page or as the current x position of the cursor. The Escape sequence

```
Esc*r0A
```

begins the image at the left graphics margin. The sequence

```
Esc*r1A
```

starts the image at the current cursor position. The data for the bit stream is then transferred. Finally, when all of the lines of the data have been transferred to the printer, the graphics transfer is ended using the command

```
Esc*rB
```

Although it is not the method I recommend, you can use DEBUG to send both the commands the printer needs (its orientation and cursor-positioning Escape sequences) and the data file it is to print in a

Bit Pattern-to-Hexadecimal Conversion Chart

At 300 dpi, an image that is 4 bits wide is very small, measuring 0.013 inches.

| Decimal | Pattern | Hexadecimal |
|---------|---------|-------------|
| 0 | | 0 |
| 1 | | 1 |
| 2 | | 2 |
| 3 | | 3 |
| 4 | | 4 |
| 5 | | 5 |
| 6 | | 6 |
| 7 | | 7 |
| 8 | | 8 |
| 9 | | 9 |
| 10 | | A |
| 11 | | B |
| 12 | | C |
| 13 | | D |
| 14 | | E |
| 15 | | F |

■ PC LAB NOTES

single sequence. If, as I do, you separate the data from the rest of the graphics commands, you will need several additional short files to produce the graphics image on the printer. On the other hand, doing so simplifies the debugging stage when working on the graphics image. Changes can be made to the data itself and not the mechanism that prints it.

I use a file called GRAPHST that selects the resolution for the printer and sets the printer into graphics mode, choosing the appropriate position for the cursor. The contents of GRAPHST suitable for your own experimentation might be

```
Esc*p300x300YEsc*t75REsc*r1A
```

This moves the cursor 1 inch away from the top-left-hand corner of the page in both the vertical and horizontal positions, sets the resolution to 75 dpi, and starts graphics mode at the current cursor position.

A second file, GRAPHEND, can be used to turn off the graphics mode after the data stream has been sent. A third file, EJECT, is then used to eject the page and reset the printer. If no text is to be printed on the same page, these two commands can be combined into one file. The contents of GRAPHEND would be

```
Esc*rB
```

The contents of EJECT would be

```
Esc&l0H
```

Putting it all together, once you have generated your graphics data file, the following DOS command will print it out:

```
COPY GRAPHST+DATAFILE+GRAPHEND  
+EJECT /B LPT1:
```

[The above represents a single line of code.—Ed.]

MACROS If you have an image that will be used frequently, it may be convenient to store it in the printer as a macro. It can then be recalled immediately whenever desired. There are two types of macros: temporary and permanent. The temporary macros remain in the printer's memory until the printer is reset either from the front panel or by the reset command (EscE). The permanent macros remain in the printer's memory until its power is turned off or the macro is deleted via Escape codes.

Defining a macro is similar to defining a graphics image. First, the number of the macro to be defined is sent to the printer, followed by the command to start the macro definition. Next, the command sequence that is to be executed every time the macro is requested is sent, followed by the command to end the macro definition. Finally, a command is sent that selects whether the macro is temporary or permanent.

To illustrate the process, the Escape sequence to create a permanent macro that prints the text, "PC Magazine Sample Macro," with an ID number of 2 is

```
Esc&f2yBPC Magazine Sample Macro  
Esc&f1X  
Esc&f2y18X
```

The first line of Escape codes numbers the macro (Esc&f2Y) and begins its definition (Esc&f0X). The text, followed by a CR-LF, makes up the macro itself, and the Escape sequence Esc&f1X ends the macro definition. Macro number 2 is then made permanent, with the last line of code. (To make the macro temporary instead of permanent you'd replace the number 10 in the last line with the number 9.)

There are three different ways that a macro can actually be used. In HP's PCL terminology these are execute, call, and overlay. The *execute* command simply calls the macro, executes each of the lines of control codes in the macro definition in turn, and then returns to the rest of the control sequences as if the macro commands were a part of the main program.

The *call* command saves the current printer environment, calls the macro, executes each of the lines of control codes in the macro definition in turn, restores the environment, and then returns control to the main program. The third command, *overlay*, lets you execute the macro as the last item on every page. This does not mean that the macro must be printed at the bottom of the page. Rather, it means that when the page is composed within the printer, the macro is laid on the page as the final item before the printout. Like the call command, overlay preserves the current environment of the printer. (An additional command is used to turn off the automatic overlay process for a particular macro.)

Six features are preserved in the printer

environment. These are page length, page size, orientation, paper source, number of copies, and cursor position stack. If a macro is *executed* and the macro contains a command that changes any of these six functions, they remain changed when the macro terminates. If the macro is *called*, the original environment is restored. It is important to notice that the cursor position is not automatically preserved when a macro is used. The cursor position can be preserved, however, by using the push command before calling or overlaying a macro and then popping the position after the macro command. The cursor position stack is not preserved when the macro is executed.

The ability to preserve the current printer environment is an important feature. Suppose you have a macro that prints a wide spreadsheet on a landscape page in the middle of a portrait document. If the macro was simply executed, you would have to make provision to restore the page layout (page length, size, and orientation) before the macro was executed. Only thus would the rest of the document return to the same format as the pages before the

Macro Control Commands

| Description | Escape sequence |
|-----------------------------|-----------------|
| Start macro definition | Esc&f0X |
| End macro definition | Esc&f1X |
| Execute macro | Esc&f2X |
| Call macro | Esc&f3X |
| Enable overlay | Esc&f4X |
| Disable overlay | Esc&f5X |
| Delete all macros | Esc&f6X |
| Delete all temporary macros | Esc&f7X |
| Delete macro by ID number | Esc&f8X |
| Make a macro temporary | Esc&f9X |
| Make a macro permanent | Esc&f10X |

A macro will support two levels of nesting via the call and execute commands, but no other macro control commands can be present in a macro.



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landscape page. If you call rather than execute the macro, however, the print environment will be restored automatically. You'll find the macro overlay command useful if you need to create printed forms and fill them in at the same time in the middle of a document.

The various macro control commands are listed in the table "Macro Control Commands" located on the preceding page. Each of the commands applies to the last ID number specified. In order to ensure that the command is going to apply to the ID number you want, it's a good idea to specify the ID number in the command sequence each time. Just use the syntax shown in the macro definition example. The automatic overlay command remains active until it is canceled or a reset command is issued, or the page length, orientation, or size is changed.

There are several rules that apply to the contents of a macro. First, call and execute are the only macro control commands that can be used inside a macro. The call and execute commands can provide up to two levels of nesting. This means that macro #1 can contain an execute command to call macro #2, and macro #2 can contain an execute command to call macro #3, but macro #3 cannot contain a call or execute command. Second, fonts cannot be deleted, made permanent, or downloaded in a macro. Third, up to 32 macros can be stored on the printer at any one time, although the ID number for each can be between 0 and 32767.

PAGE DESIGN LIMITATIONS The multiple abilities to handle both internal and computer-generated graphics images, to move the cursor in a variety of ways, and even to support macro commands are obviously powerful features for customizing page layouts.

Adding batch files for such routine activities as downloading fonts to the printer can increase the printer's ease of use. There are, however, limits to the complexity and amount of data you can put on a single page. The basic limitation, common to all page printers, is the amount of memory that's built into them.

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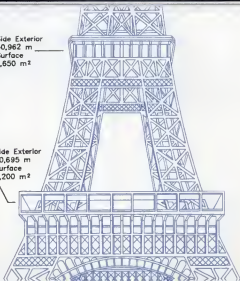
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has more information on it than the memory can store at once, the page will not be printed correctly. The error messages obtained vary, depending on whether there is just too much information on the page to fit into memory or the number of rules and patterns that are on the page exceeds the built-in limit. The printer may print the page in parts on separate sheets of paper, or it may complain that it can't cope by displaying an error message.

Different printers have different complexity limits and memory capacities, depending on the manufacturer and model. For example, the HP LaserJet series II comes with 512KB of memory as standard. Some of this is taken up by the printer itself, leaving 395KB of memory for the

■ Using built-in rules or patterns is more memory efficient than drawing the raster graphics shape.

page contents.

An additional memory board can be purchased to increase the total memory to 1.5, 2.5, or 4.5MB. These will allow more-complicated pages to be printed without running out of memory.

Using the built-in rules or patterns is more memory efficient than drawing the raster graphics shape, but the more rules there are on a page, the more likely that the printer will not be able to compose the page completely before its internal microprocessor limits are reached. Further, the built-in rules only allow construction of rectangular shapes, and so are not ideal for general graphics images. Creating graphics images are a challenge to your creative imagination as well as to your patience. Most LaserJet II users will spend more time printing text, however, which will be considered next time.

Caroline Holliday is an electrical engineering consultant with High Tech Aid and specializes in technical documentation and teaching for the PC environment.

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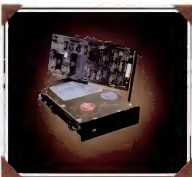
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■ ENVIRONMENTS ■ CHARLES PETZOLD

KEYBOARD MONITORS UNDER OS/2

The way OS/2 handles the keyboard eliminates the interrupt 9 problems that have plagued TSRs under DOS, though it does involve a certain amount of MonKey business.



Years from now, when programmers reminisce about the old days, someone is likely to ask, "Remember interrupt 9?" And everyone else will groan.

Interrupt 9 is generated by the PC's keyboard hardware whenever a key is pressed. Although most DOS application programs use interrupt 16h to obtain keyboard information, many RAM-resident pop-up programs intercept interrupt 9 to watch for their hotkeys. RAM-resident keyboard macro programs seize interrupt 9 in order to translate certain key combinations into character strings. Even some normal DOS application programs intercept interrupt 9 in order to be able to use key combinations that are not defined by the PC BIOS.

Interrupt 9 has come to symbolize for me some of the real problems in DOS. Anybody who has written a RAM-resident pop-up program or even used multiple RAM-resident pop-ups knows what I'm talking about. Very often the programs must be loaded in a particular order, and even then they often interact with each other in undesirable ways. When a program that intercepts interrupt 9 wishes to discard a keystroke, it must reset the 8259 interrupt controller, which is a device that should be accessed only by the operating system.

Under DOS, the most recent program that grabs interrupt 9 gets first dibs on the keystrokes. Thus, when a normal application program intercepts interrupt 9, it effectively disables all the pop-up programs loaded earlier. Around *PC Magazine* we

used to call this phenomenon "the XyWrite problem," in honor of one program that did this. [XyWrite III and III Plus no longer commandeer interrupt 9, but a number of programs still do.—Ed.]

The problem with the older versions of XyWrite and with other applications led to the extraordinary measures taken by Borland with *SideKick*. *SideKick* always ensures that it gets first dibs on keystrokes by intercepting the hardware timer (interrupt 8) and reinstalling itself. This process, of course, often causes problems with other pop-ups.

INTERCEPTING I/O UNDER OS/2

Under the protected mode of OS/2, programs can no longer intercept interrupt 9. In fact, interrupt 9 no longer exists as a hardware interrupt. Instead, OS/2 provides a built-in generalized mechanism that allows programs to examine and alter an input or output stream, such as the input

stream coming from the keyboard or the output stream going to the printer.

Let's get the lingo down first. Under OS/2, rather than "intercept an interrupt," you "install a monitor." The monitor gives a program access to an input or output stream as it is being processed by the device driver. OS/2 monitors do not solve all the interrupt 9 problems we've experienced under DOS, but they make major steps in solving some of those problems.

The device driver itself determines whether it supports monitors. Currently, only the keyboard and printer device drivers do so. (Installing a printer monitor under OS/2 is similar to intercepting interrupt 17h under DOS. OS/2 includes a program called SPOOL that installs a printer monitor to save printer output to files. SPOOL then transfers printer output to the printer while other programs are running.) In this column I'll concentrate on keyboard monitors.

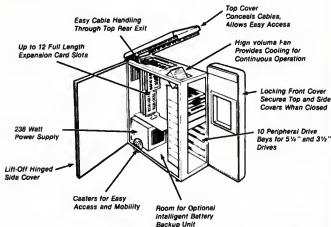
USES OF KEYBOARD MONITORS

You'll recall from my last column that the *KbdCharIn* function normally used by application programs to obtain keyboard input is very similar to the PC BIOS interrupt 16h under real mode. It reports only keypresses (not key releases), and it doesn't report undefined key combinations.

OS/2 application programs that need information about every keyboard event can install a keyboard monitor. For example, a protected-mode version of XyWrite (which I understand is under development at this time) can still use all the undefined keystrokes the DOS version uses.

■ Under the protected mode of OS/2, programs can no longer intercept interrupt 9, which in fact no longer exists as a hardware interrupt.

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■ ENVIRONMENTS

The OS/2 Presentation Manager (the forthcoming OS/2 windowing system, similar to *Microsoft Windows*) itself installs a keyboard monitor so it can report detailed keystroke information to Presentation Manager programs.

Keyboard monitors can also be used by OS/2 programs running in the background, including keyboard macro programs and hotkey pop-ups. However, pop-ups don't make much sense in the Presentation Manager. This is because a program running in the Presentation Manager can load itself in a "minimized" state and be displayed as an icon at the bottom of the screen. The icon can then be expanded into a window using the mouse or the keyboard. It doesn't need its own hotkey.

Even under the command line interface of the OS/2 Kernel, many current pop-ups can be written as normal programs to run in their own screen group. The user simply switches screen groups to get at the program.

OS/2 MONITOR FUNCTIONS OS/2 has five different functions that pertain to monitors. All of them begin with the preface *DosMon*.

When a program wishes to install a monitor, the first step is to call *DosMonOpen*. Here's the C syntax for opening a keyboard monitor:

```
DosMonOpen ("KBD$", &MonitorHandle);
```

The first parameter is the ASCII name of the device and the second parameter is a pointer to an integer variable. This variable receives the "monitor handle" that is then used in some of the other monitor functions. *DosMonOpen* returns a nonzero value if the function fails (for example, if the device driver does not support monitors).

The second step is for the program to register the monitor:

```
DosMonitor (MonitorHandle, InBuffer, OutBuffer,  
PosFlags, ScreenGroup);
```

[The above represents a single line of C code.—Ed.] The *MonitorHandle* parameter is the value obtained from the *DosMonOpen* function. The *InBuffer* and *OutBuffer* variables are the addresses of two-character arrays. The documentation I have states, somewhat ambivalently, that these arrays "must be at least 64 bytes

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long, although 128 bytes is the recommended length." Before calling DosMonReg, set the first word to the length of the array. During the DosMonReg call, OS/2 formats these buffers to contain data it needs internally to maintain the keyboard monitor. You don't actually use these buffers for anything in your program.

The PosFlag parameter of DosMonReg allows a program to specify its position in the monitor chain if multiple keyboard monitors are installed. I'll discuss this in more detail in the section on "Multiple Keyboard Monitors."

The meaning of the last DosMonReg parameter depends on the particular device

■ OS/2 has five different functions that pertain to monitors. All of them begin with the preface DosMon.

you're monitoring. For keyboard monitors, this is a number indicating the screen group for which the monitor is applicable. A keyboard monitor sees keystrokes for only one screen group. I'll have more to say about this in the section on "Background Monitors."

Following the DosMonReg call, the keyboard monitor is installed. The program can then sit in a loop calling two functions, DosMonRead and DosMonWrite.

DosMonRead obtains the next keystroke from the input stream. The syntax is

```
dosmonread (inbuffer, howtoflag, monkeydata,
            keystrokecount);
```

[The above represents a single line of C code.—Ed.] Normally you'll set the NoWaitFlag to 0. In that case the DosMonRead function does not return until a keystroke is available. The third parameter is a pointer to a structure of type MonKeyData that the device driver fills with information about the keystroke. I'll discuss the format of this structure later in the section on

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"The MonKeyData Structure."

The last parameter of DosMonRead is a pointer to a variable containing an integral multiple of the size of the MonKeyData structure. This indicates the maximum number of keystrokes you can handle in one call. When DosMonRead returns, ByteCount is set to the number of key-strokes that were passed to your program.

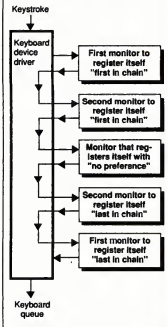
The program can then examine the fields of the MonKeyData structure. The keystroke can be altered by changing the fields. The program calls DosMonWrite to put the keystroke back into the input stream:

```
DosMonWrite (OutBuffer, MonKeyData, ByteCount)
```

The ByteCount field is an integral multiple of the size of MonKeyData and indicates how many keystrokes the program is returning to the device driver.

KeystrokePasses

A chain of keyboard monitors in the keyboard input stream.



If your program simply calls DosMonRead and then DosMonWrite, without making any changes to the MonKeyData fields, then the keystrokes remain unaltered. Programs can remove a keystroke from the input stream by not calling DosMonWrite for the keystroke. This is what a pop-up program would do for its hotkey. A keyboard macro program would make multiple DosMonWrite calls based on a single keystroke obtained from DosMonRead to insert keystrokes into the input stream.

When the program wants to deinstall the keyboard monitor, it calls

```
DosMonClose (MonitorHandle) ;
```

MULTIPLE KEYBOARD MONITORS

Just as, under DOS, more than one program can intercept interrupt 9 and form a chain of keyboard handles, multiple OS/2 programs can each install a keyboard monitor for a particular screen group.

As I indicated earlier, under DOS, the most recent program that intercepts interrupt 9 always gets the first shot at the keystrokes. In OS/2, a program that installs a keyboard monitor can specify where in the chain the keyboard monitor is installed. The desired position of the keyboard monitor is specified in the PosFlag word of the DosMonReg function. This flag can have one of three values:

- No preference
- First in chain
- Last in chain

If two or more keyboard monitors each specify "first in chain" or "last in chain," then the first keyboard monitor to be registered remains first or last. The passing of keystroke information among the multiple keyboard monitors is handled by OS/2 and the keyboard device driver, as shown in the diagram "Keystroke Passes."

When a keyboard event occurs, the device driver passes the keystroke to the first keyboard monitor in the chain. The program returns from its DosMonRead call and processes the keystroke. Any keystrokes it passes back to the device driver via DosMonWrite are then passed to the next monitor in the chain.

Keyboard macro programs will probably install themselves as the first in the chain. Application programs that use key-

■ Both DosMonRead and DosMonWrite require a pointer to a structure of type MonKeyData.

board monitors can install themselves last in the chain. This allows the keyboard macros to work within the application program.

OS/2 pop-ups should probably install themselves with "no preference." This allows them to be popped up in response to a hotkey combination that a keyboard macro program generates. The "no preference" ordering also allows the pop-up to discard its hotkey and not pass it on to an application program.

Because the chaining of one keyboard monitor to another is not handled within your program, you can deinstall your monitor whenever you want by calling DosMonClose. By contrast, the deinstallation of RAM-resident programs under DOS is a job that currently requires separate utilities that save the interrupt vector states at various points during the loading of the programs. The DOS programs must be deinstalled in a reverse order from the order in which they're loaded. Under OS/2, this is not a problem.

THE MONKEYDATA STRUCTURE

Both DosMonRead and DosMonWrite require a pointer to a structure of type MonKeyData. You can define this structure in a C program, as shown in Figure 1.

When the DosMonRead function returns control to your program, this structure is filled in with information about the keystroke. When you call DosMonWrite, this structure contains keyboard information that is passed to the next monitor or (ultimately) placed in the keyboard queue for normal access by the KbdCharIn function.

The MonKeyData structure has a KeyData structure embedded between two flag words. This KeyData structure is the same structure I discussed in the last Environ-

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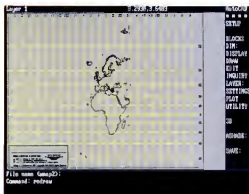
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| Compaq 286, 8mb/8 80286 with 5.33 mhz 80287,
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■ ENVIRONMENTS

```

struct MonKeyData {
    unsigned int    MonFlagWord ;
    struct KeyData  kd ;
    unsigned int    KbdDDFlagWord ;
}
mkd ;

```

Figure 1: The C language structure used with keyboard monitors.

ments column, used to return keyboard information to your program when you call the KbdCharIn function.

The current OS/2 documentation I have states that the low byte of MonFlagWord contains the hardware scan code. Actually, it is the high byte of MonFlagWord that has this code. (Note that this is the real hardware scan code, not the scan_code field of the KeyData structure, which is the extended keyboard code familiar to DOS programmers.) The high bit of this hardware scan code is set if the key is being released.

The KbdDDFlagWord provides some additional information about the keystroke, as shown in the diagram "KbdDDFlagWord Field Organization."

The "key identifier" is a code that indicates the general type of keystroke. For example, 00h is a normal key, 07h is a Shift key, 08h is Pause, 13h is Print Screen, and so forth. Codes 01h through 04h are used for some of the special codes that are generated by the hardware of the IBM PC AT keyboard. In the Enhanced keyboard, these codes can be used to differentiate between the separate cursor movement keys

and the cursor movement keys that are part of the numeric keypad.

For example, pressing and releasing the Down Arrow key on the numeric keypad generates two keystrokes. The scan code in the MonKeyFlag is 50h when the key is pressed and D0h when the key is released. The KbdDDFlagWord is 0 when the key is pressed and 40h (indicating a release) when the key is released.

But when you press and release the separate Down Arrow key on the Enhanced keyboard, you get four keystrokes. The first and third have a scan code of E0h and a KbdDDFlagWord of 02h, indicating a secondary key prefix. The second and fourth keystrokes are the same as those returned for the numeric keypad's Down Arrow key, except that the KbdDDFlagWord is 80h when the key is pressed and C0h when the key is released. This bit indicates that the previous key was a prefix.

BACKGROUND MONITORS An OS/2 session is divided into multiple screen groups, each of which can run one or more programs. A particular keyboard monitor receives keystrokes for only one of these

screen groups. When you install a keyboard monitor you indicate the screen group in the last parameter of DosMonReg. Current documentation says that you can use 0 to specify the screen group in which the program is running, but this does not seem to work with the version of OS/2 I have.

When a foreground application program installs a keyboard monitor, it can obtain the particular screen group that the program is running in by first calling DosGetInfoSeg:

```
DosGetInfoSeg (&GlobalSeg, &LocalSeg);
```

This function returns two selectors (segment addresses) that access some useful information. GlobalSeg is a selector in the global descriptor table and references a segment common to all processes running under OS/2. LocalSeg is a selector in the process's own local descriptor table.

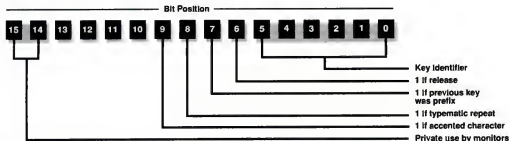
The screen group in which a process is running is stored 8 bytes into the local information segment. It can be extracted with the following C code:

```
ScreenGroup = *((unsigned int far *)
               (((long) LocalSeg << 16) + 8));
```

[The above represents a single line of C code.—Ed.] For an application program running in the foreground, this is the value to be passed as the last parameter to DosMonReg.

For a pop-up or keyboard macro program running in the background, this is not the case. In previous Environments columns I've discussed the OS/2 DETACH

KbdDDFlagWord Field Organization



■ ENVIRONMENTS

```

/*-----
MACDEMO.C -- OS/2 Keyboard Macro Demonstration
(c) 1988, SLI-Data Communications Company
Programmed by Charles Petzold, 11/87
-----*/

#include <dos.h>
#include <conio.h>
#include <string.h>

main()
{
    static struct
    {
        char scan;
        char *str;
    }
    table[] = {
        {0x24, "DIR"},
        {0x25, "CHKDSK"},
        {0x26, "VER"}
    };

    struct MonKeyData
    {
        unsigned int MonFlagWord;
        struct KeyData kd;
        unsigned int XldDirFlagWord;
    }
    mhd;

    char InBuffer[128], OutBuffer[128];
    unsigned int GlobalSeq, LocalSeq, ScreenGroup, MonitorHandle;
    unsigned int count, len, i, j;

    DOSMOPEN ("KBD", &MonitorHandle);

    * (int *) InBuffer = sizeof (InBuffer);
    * (int *) OutBuffer = sizeof (OutBuffer);

    DOSGETINFO (GlobalSeq, LocalSeq);

    ScreenGroup = * ((unsigned char far *) (((long) GlobalSeq << 16) + 24));

    DOSMOPEN (MonitorHandle, InBuffer, OutBuffer, 0, ScreenGroup);

    while (1)
    {
        count = sizeof (mhd);
        DOSMREAD (InBuffer, 0, (char far *) &mhd, &count);
        if (mhd.kd.char_code == 0 && mhd.XldDirFlagWord == 0)
        {
            for (i = 0; i < sizeof (table) / sizeof (table[0]); i++)
            {
                if (mhd.kd.scan_code == table[i].scan)
                {
                    len = strlen (table[i].str);
                    mhd.MonFlagWord = 0;
                    mhd.kd.scan_code = 0;
                    mhd.kd.status = 0;
                    mhd.kd.cls_shift = 0;
                    mhd.kd.shift_state = 0;
                    for (j = 0; j < len; j++)
                    {
                        mhd.kd.char_code = table[i].str[j];
                        DOSMWRITE (OutBuffer, (char far *) &mhd,
                                sizeof (mhd));
                    }
                    break;
                }
            }
        }
        else
        {
            DOSMWRITE (OutBuffer, (char far *) &mhd, count);
        }
    }
}

```

Figure 2: An OS/2 demonstration program that illustrates the use of keyboard monitors.

command, which runs as follows:

DETACH progname

When you run a detached program off the OS/2 command line, OS/2 displays the process ID number of the program and the OS/2 command prompt returns. The program runs in the background. This is how you'll load a pop-up or keyboard macro program.

However, detached programs enter what Ray Duncan has called a "black box" screen group. This prevents the detached program from interfering with the screen or with keyboard or mouse input intended for the foreground program. Here's what happens when the detached program tries to use the screen, keyboard, or mouse:

- All keyboard (Kbd) functions fail by re-

turning an error code of 464, which is defined as ERROR_KBD_DETACHED.

- All mouse (Mou) functions fail and return an error code of 466 (ERROR_MOUSE_DETACHED).

- All video I/O (Vio) functions except VioPopUp fail and return an error code of 465 (ERROR_VIO_DETACHED).

Only if the detached program calls VioPopUp can it then get access to the screen, keyboard, and mouse.

A detached program running in the background can still install a keyboard monitor, but it should not be installed for the screen group in which the program is running (the "black box" screen group). Rather, the monitor should be installed for the foreground screen group at the time the program is loaded. This screen group is 24 bytes into the global information segment:

```
ScreenGroup = * ((unsigned char far *) (((long) GlobalSeq << 16) + 24));
```

[The above represents a single line of C code.—Ed.]

When a detached pop-up program detects its hotkey during keyboard monitor processing, it can call VioPopUp to get access to the screen, keyboard, and mouse. Although it's not implemented in the version of OS/2 I have, a flag associated with VioPopUp can be set to prevent clearing the screen. The pop-up program can thus get access to the screen contents as they were before VioPopUp was called.

A KEYBOARD MACRO DEMO Now let's put everything we've learned in this column into a simple keyboard macro demonstration program called MACDEMO. The listing is in Figure 2. MACDEMO translates an Alt-D to DIR, Alt-C to CHKDSK, and Alt-V to VER. (Obviously, in a real keyboard macro program, the key translations would be stored in a file.) The program can be compiled with the OS/2 Software Development Kit and run by executing

DETACH MACDEMO

The table structure in MACDEMO.C holds the keys to be translated (which are the extended keyboard codes for Alt-D, Alt-C, and Alt-V) and the strings into which MACDEMO translates them. MACDEMO only searches for these ex-

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tended key codes when the char_code field of the KeyData structure is 0 and the KbdDDFlagWord of the MonKeyData structure is 0 (indicating a normal key depression).

If the scan-code field of the KeyData structure matches one of the keys in the table structure, MACDEMO calls DosMonWrite several times to insert the appropriate string into the keyboard stream. Otherwise, the MonKeyData structure is passed unaltered to the DosMonWrite function.

A real keyboard macro program would also provide some simple means of disabling the program or terminating it. A detached program that installs a keyboard monitor can terminate simply by calling DosMonClose and DosExit. Because memory under protected mode is movable, the program doesn't leave a "memory hole," as it does in DOS.

A real keyboard macro program would also define a keystroke that would allow a user to alter macro sequences. A detached program can do this by calling VioPopUp to gain control of a fresh screen and allow the user to enter new character codes and sequences.

MONITORS AND MULTITASKING

One of the most annoying hassles with DOS RAM-resident programs is the difficulty in making DOS calls. DOS is not reluctant, so the program has to use undocumented methods for calling DOS. This is not a problem under OS/2. The detached program monitoring the keystrokes can make OS/2 function calls for memory allocation or file I/O at any time.

However, to allow keystrokes to pass through the monitors without delay, programs should not spend much time within the DosMonRead and DosMonWrite loop. If the program has a lengthy job to do during keyboard processing, it should run the monitor in a separate thread of execution. A foreground application program that uses a keyboard monitor should queue its own keystrokes within the monitor thread and then retrieve them in the program's main thread.

I've mentioned OS/2 "threads" several times in these Environments columns. It's time to look at them in detail, and I'll do so in the next issue.

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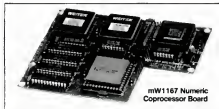
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■ POWER PROGRAMMING ■ RAY DUNCAN

TURNING BINARY VALUES INTO ASCII



When you have to print the numbers your computer crunches, you have to turn them into ASCII strings. Here's how to do it with C and assembly language routines.

In the last column, we discussed C and MASM routines that convert ASCII strings into their equivalent binary values. In this installment, we'll tackle the inverse operation: converting binary values into printable ASCII strings.

Imagine, for example, that we have in hand the number 100 as a 16-bit binary integer. This value is represented in memory as the 2-byte sequence

64h 00h

(In the Intel series of processors, the less-significant byte lies at the lower address.) In terms of ASCII codes, these 2 bytes represent a lowercase "d" and a "null" character, respectively. In order to display the number on a screen or on a list device, we must first convert our 2 bytes into the 3-byte sequence

31h 30h 30h

These bytes are the ASCII codes for the digits "100".

C CONVERSION FUNCTIONS The C runtime library contains five fundamental functions for binary-to-ASCII conversion: `itoa`, `ltoa`, `ecvt`, `fcvt`, and `gcvt` (see the table "Standard Binary-to-ASCII C Functions"). The first two operate on integers, and the other three operate on double-precision (8-byte) floating-point numbers. The five functions can be thought of as the counterparts of the ASCII-to-binary conversion functions `atoi`, `atol`, and `atof` discussed in the last column. C also supports a class of flexible, extremely powerful output formatting functions that

can accept multiple arguments of different types (`printf`, `sprintf`, `fprintf`, etc.), to be discussed in a later issue.

The `itoa` and `ltoa` library functions are invoked in the form

```
ptr = itoa(value,buffer,radix)
```

or

```
ptr = ltoa(value,buffer,radix)
```

Both accept a binary value (a normal integer for `itoa` and a long integer for `ltoa`)

and a radix to be used for the conversion, and return a null-terminated ASCII string in the specified buffer.

To demonstrate use of the `itoa` and `ltoa` functions, we can combine them with the `atoi` and `atol` functions in the simple interactive program TRY-XTOA.C, which is listed in Figure 1. This program simply reads a string from the keyboard, converts it to an integer or long integer, and then reconverts the binary values to strings for display. Try entering a

Standard Binary-to-ASCII C Functions

| | |
|----------------------|--|
| <code>itoa</code> | Converts an integer to a null-terminated string. |
| <code>ltoa</code> | Converts a long integer to a null-terminated string. |
| <code>ecvt</code> | Converts a floating-point number to a null-terminated ASCII string. The total number of digits in the string is specified by the caller. |
| <code>fcvt</code> | Similar to <code>ecvt</code> , but with rounding of the last digit according to FORTRAN "F" conventions. The number of digits after the decimal point is specified by the caller. |
| <code>gcvt</code> | Similar to <code>ecvt</code> and <code>fcvt</code> , but produces a specified number of significant digits in FORTRAN "F" or "E" formats in user-specified buffer, including sign, decimal point, and exponent if necessary. |
| <code>printf</code> | Formatted output with multiple arguments to the standard output (stdout) device (may be redirected). |
| <code>cprintf</code> | Similar to <code>printf</code> , but output directed to console. |
| <code>fprintf</code> | Similar to <code>printf</code> , but output directed to file or device specified by handle. |
| <code>sprintf</code> | Similar to <code>printf</code> , but formatted output placed in user-specified buffer as a null-terminated string. |

■ POWER PROGRAMMING

number with more than five digits, or containing alphabetic characters, and observe the results. You'll quickly discover that these functions draw little distinction between a valid numeric string, an invalid string, an overflow, and no entry at all.

The three floating-point conversion functions—`ecvt`, `fcvt`, and `gcvt`—all operate on double-precision (8-byte) real numbers but differ slightly in the way they format those numbers and in where they place the resulting string.

The `ecvt` function is used in the form

```
ptr = ecvt(value,digits, &decptr, &signflag)
```

where `value` represents the floating-point number to be converted to ASCII, `digits` is the number of ASCII characters in the output string, and `decptr` and `signflag` are two integer variables. The `&` operator causes the address of the variable to be passed in-

stead of the value of the variable.

The function `ecvt` returns a pointer (`ptr`) to the converted string, which contains exactly the specified number of characters regardless of the size or sign of `value`. It places a 1 in `signflag` if the number is negative, a 0 if it is not, and it places the position of the decimal point (positive or negative) relative to the beginning of the string in `decptr`.

For example, if `ecvt` is called with `value = 6.02 * 1023` and `digits = 7`, it will return the ASCII string

```
6020000
```

together with the value 24 in `decptr` and the value 0 in `signflag`.

The `fcvt` function is used in the form

```
ptr = fcvt(value,digits, &decptr, &signflag)
```

Although the parameters are similar, the

`digits` parameter for `fcvt` specifies the number of characters formatted after the decimal point rather than the total number of characters. For example, if `fcvt` is called with `value = 3.14` and `digits = 4`, it will return the ASCII string

```
31400
```

with `decptr = 1` and `signflag = 0`.

The `gcvt` function is used in the form

```
ptr = gcvt(value,digits,buffer)
```

where `buffer` is the location to store the converted string and `digits` specifies the maximum length of the string. The function `gcvt` first attempts to format `value` within the constraint of `digits`, using the FORTRAN "F" format—that is, all significant digits are displayed and there is no explicit exponent. That failing, `gcvt` formats the number into a pseudo-FOR-

```
/*
TRYXTOA.C
Programmed by Ray Duncan, October 1987
*/

#include <stdio.h>
#include <stdlib.h>

main(int argc, char *argv[])
{
    char buff[80]; /* keyboard input buffer */
    int lvar; /* an integer variable */
    long lvar; /* a long integer variable */

    while(1)
    {
        printf("\nEnter a number (0 to quit): ");
        gets(buff); /* read string from keyboard */

        if (buff[0] == 'q' || buff[0] == 'Q') break; /* exit if 'q' or 'Q' entered */

        if (buff[0] == 'q' || buff[0] == 'Q') break;

        /* convert in various ways */
        lvar = atoi(buff); /* string to int */
        lvar = atol(buff); /* string to long int */

        /* display binary results */
        printf("\n\t atoi(your entry) = %d ", lvar);
        printf("\n\t atol(your entry) = %ld ", lvar);

        /* convert integer to ASCII and display it */
        ltoa(lvar, buff, 10);
        printf("\n\t ltoa(your entry) = %s ", buff);

        /* convert long integer to ASCII and display it */
        ltoa(lvar, buff, 10);
        printf("\n\t ltoa(your entry) = %s ", buff);
    }
}
```

Figure 1: TRYXTOA.C demonstrates the C functions `ltoa` and `ltoa`.

```
/*
TRYXCVT.C
Programmed by Ray Duncan, October 1987
*/

#include <stdio.h>
#include <stdlib.h>

main(int argc, char *argv[])
{
    double value; /* value to be converted */
    int digits; /* number of digits stored */
    char buff[80]; /* buffer to hold ASCII string */
    int decptr; /* receives position of decimal point */
    int signptr; /* receives flag specifying sign */
    char *strptr; /* receives pointer to string */

    while(1)
    {
        printf("\nEnter digits (0 to quit): ");
        gets(buff); /* read string from keyboard */

        if (buff[0] == 'q' || buff[0] == 'Q') break; /* exit if 'q' or 'Q' entered */

        if (buff[0] == 'q' || buff[0] == 'Q') break;

        digits = atoi(buff); /* convert digits to format */

        /* prompt for value to convert */
        printf("\nEnter value: ");
        gets(buff); /* read string from keyboard */

        value = atof(buff); /* convert string to 8-byte real value */

        /* convert value to string with ecvt */
        strptr = ecvt(value, digits, &decptr, &signptr);

        /* display results of conversion */
        printf("\necvt(%f) = %s, decimal position = %d, sign = %d",
            value, strptr, decptr, signptr);

        /* convert value to string with fcvt */
        strptr = fcvt(value, digits, &decptr, &signptr);

        /* display results of conversion */
        printf("\nfcvt(%f) = %s, decimal position = %d, sign = %d",
            value, strptr, decptr, signptr);

        /* convert value to string with gcvt */
        strptr = gcvt(value, digits, buff);

        /* display results of conversion */
        printf("\ngcvt(%f) = %s, value, strptr);
    }
}
```

Figure 2: TRYXCVT.C demonstrates the C formatting routines `ecvt`, `fcvt`, and `gcvt`.

■ POWER PROGRAMMING

```

not    dx          ; it was negative, take 2's
not    ax          ; complement of the value.
add    ax,1
adc    dx,0

ltos1:                ; divide value by radix to extract
                    ; next digit for forming string.
call    divide       ; no, divide by radix.
add     bl,'0'       ; convert remainder to ASCII digit
cmp     bl,'9'       ; in case converting to hex ASCII,
jla     ltos2        ; jump if in range 8-9,
add     bl,'A'-'9'+1 ; correct digit if in range A-F.

ltos2: dec          si ; back up through buffer
mov     [si],bl      ; store this character into string.
mov     bx,ax        ; is value = zero yet?
or      bx,dx
jne     ltos1        ; no, convert another digit.

popfd  jne         ltos3 ; was original value negative?
jne     ltos3        ; no, jump

dec     si           ; yes, store sign into output string.
mov     byte ptr [si], '-'

ltos3: pop          ax ; calculate length of string
sub     ax,si        ; back to caller.
ret

ltos4 andp

; General purpose 32 bit by 16 bit unsigned divide.

; This routine must be used instead of the machine's
; usual unsigned divide for cases where the quotient
; may overflow 16 bits (for example, 100,000 / 2).
; If called with a zero divisor, this routine returns the
; dividend unchanged and gives no warning.
;
; Call with:  DX:AX = 32 bit dividend
;            CX = divisor
; Returns:    DX:AX = quotient
;            BX = remainder
;            CX = divisor (unchanged)
;
divide proc near
    ; Divide DX:AX by CX
    divl    divl      ; exit if divide by zero
    push    ax        ; $dividend_hi/divisor
    mov     ax,dx
    mov     dx,dx
    div     cx
    mov     bx,ax      ; BX = quotient1
    pop     ax         ; remainder1:dividend_lo/divisor
    div     cx         ; BX = quotient2
    mov     bx,dx      ; DX:AX = quotient2:quotient1
    divl    rat        ; BX = remainder2
divide endp
    _TEXT ends
end

```

(Figure 4 ends)

```

name    tryitoe
title   TRYITOE
page    55,132

;
; TRYITOE.ASM --- a simple demonstration of
; the ITOS and ATOI routines.
;
; Ray Duncan, October 1987
;
or      equ     $dh
if      equ     $ah

GROUP   group    _DATA

_TEXT   segment word public 'CODE'
assume  cs:_TEXT,ds:_DATA

extrn  itos:near
extrn  atoi:near

main    proc    owar

mov     ax,_DATA      ; make our data segment
mov     ds,ax
mov     ax,ax

main1:  mov     dx,offset prompt ; display a prompt
        mov     cx,p_len        ; to the user...
        mov     bx,1            ; "Enter value: "
        mov     ah,40h
        int     21h
        jc      main2           ; if error, just exit

        mov     dx,offset inbuff ; read keyboard entry
        mov     cx,0           ; from the user...
        mov     bx,0
        mov     ah,3fh
        int     21h
        jc      main2           ; if error, just exit

        cmp     ax,2            ; did he enter anything?
        ja      main2           ; empty line, exit

        mov     dx,offset display ; display "you entered: "
        mov     cx,d_len        ; to the user...
        mov     bx,1

        mov     ah,40h
        int     21h
        jc      main2           ; if error, just exit

        mov     dx,offset outbuff ; output ASCII string
        mov     cx,0
        mov     bx,1
        mov     ah,40h
        int     21h
        jc      main2           ; if error, just exit

        jmp     main1           ; do it again...

main2:  mov     ax,cx00b        ; fice! exit to MS-DOS
        int     21h

main    andp

_TEXT   ends

_DATA   segment word public 'DATA'

prompt  db      "Enter a number: "
p_len   equ     $-prompt
display db      "Enter value: ",4 dup(32)
d_len   equ     $-display
inbuff  db      0 dup (?)
outbuff db      0 dup (?)

_DATA   ends

STACK   segment para stack 'STACK'
        db      128 dup (?)

STACK   ends

end     main

```

Figure 5: The source code for the demonstration program TRYITOE.ASM.

They accept a binary value, radix, and the address of a buffer, and return the address of the resulting ASCII string. The only key difference is that the MASM versions return the address and length of a string rather than the address of a null-terminated string.

The logic of the assembly language ITOA (Figure 3) is quite straightforward. The 16-bit binary number is converted to its absolute value and is then repeatedly divided by the radix in order to extract the digits of the forming string. At the end, the sign of the original value is recalled, a minus (-) character is stored at the head of the string if necessary, and the length of the string is calculated. You may find it instructive to single-step through this routine with a symbolic debugger.

The routine LTOA (Figure 4) follows the same general logic as ITOA, but is somewhat more complex because the Intel 80x86 family does not have a divide instruction that returns a 32-bit quotient and a 16-bit remainder. This is needed in order to convert a 32-bit binary value fully. Therefore, such an operation must be synthesized from the usual unsigned divide instruction in the subroutine "divide".

Like the C library functions `itoa` and `ltoa`, the MASM procedures ITOA and LTOA take for granted that the supplied buffer will be of adequate size. That size, of course, varies with the radix used.

The simple program TRYITOA listed in Figure 5 combines the ITOA.ASM routine in this column with the ATOL.ASM routine from my last column. It demonstrates the input of a string, the conversion of that string to binary, the conversion of the binary value back to an ASCII string, and the display of the result. You can assemble and link the files ATOL.ASM, ITOA.ASM, and TRYITOA.ASM into the executable file TRYITOA.EXE with the following sequence of commands:

```
MASM ITOA;
MASM ATOI;
MASM TRYITOA;
LINK TRYITOA+ATOI+ITOA;
```

A few minutes' work will adapt TRYITOA.ASM into the program TRY-LTOA.ASM, which will exercise the routines LTOA.ASM and ATOL.ASM in a similar manner.

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■ DOUGLAS COBB AND STEVEN COBB

SPREADSHEET CLINIC



Handling trailing plus and minus signs; running batch files in Symphony; erroneous values returned by Symphony's @IRR function; converting serial date values into strings.

RUNNING DOS FROM SYMPHONY

I'd like to offer an easier solution to the problem of running batch files from within Symphony via the DOS.APP add-in application function than the one offered by David Gulliksen (Spreadsheet Clinic, PC Magazine, September 15, 1987). My suggestion involves using a secondary command processor.

When you invoke DOS.APP, Symphony displays the prompt "Press [RETURN] or enter program name:" at the top of the screen. To enter DOS and run a batch file automatically, just enter

```
\COMMAND /c filename
```

where *filename* is the name of the batch file you want to run.

The backslash routes Symphony to the copy of COMMAND.COM in the root directory. This eliminates the need to keep a duplicate copy of that file in your Symphony directory. The /C parameter allows the name of the batch file to be passed to the secondary command processor and automatically returns you to the parent command processor after the batch file has been executed. Since Symphony controls the parent command processor, control will be returned to Symphony automatically—there's no need to type "exit."

Sam Levitt

Rochester, New York

We received a good many other letters suggesting this same excellent technique. As Charles Hannum of Henryville, Pennsylvania, explained, "When Symphony loads, it destroys the transient portion of

COMMAND.COM—the portion that is needed to run batch files. The COMMAND /C command solves this problem by loading a second copy of COMMAND.COM. Since this copy is complete, DOS can use it to interpret the batch file." This method is easier and uses less memory than the one that was suggested in the earlier column.

PARSING FILENAMES

A submission from Dan Will ("Listings into Filenames," Spreadsheet Clinic, PC Magazine, October 13, 1987) uses a {contents} command to strip the trailing spaces from a filename after using an @LEFT command to extract the first eight characters from an imported directory listing.

Although Mr. Will's method works, it is far more complex than need be. 1-2-3's @TRIM function does exactly what Mr. Will is trying to do with the {contents} command—it strips any trailing (and leading) spaces from a string. To extract the filename from a line of an imported direc-

tory listing, you can simply use the function @TRIM(@LEFT(LONG,8)), where LONG is the cell that contains the line from the imported directory.

Tom Cottingham
Louisville, Kentucky

This is perfectly correct. Although you won't use the @TRIM function often, it sure is handy when you need it.

DATE VALUES INTO LABELS

I recently needed to convert a column of formatted serial date values into strings in 1-2-3, Release 2.01. The column of date values was 12 spaces wide, and each value used Date format #4 (the Long International form), which displays dates in mm/yy/dd form. For example, the serial date value for August 21, 1987 (32010) would be displayed as 08/21/87. I wanted to convert this entry into the label '08/21/87.

I developed the macro shown in Figure 1 to perform these conversions. The state-

| | A | B | C | D | E |
|---|----|---|---|---|---|
| 1 | \d | /rncSOURCE" | | | |
| 2 | | /rndSOURCE" | | | |
| 3 | | /rncSOURCE" | | | |
| 4 | | {contents SOURCE,SOURCE} | | | |
| 5 | | {Edit}{BS}{Home}{Right}{Del 3}" | | | |
| 6 | | {Down} | | | |
| 7 | | {If @CELLPOINTER("contents")="@"}{Quit} | | | |
| 8 | | {Branch \d} | | | |
| 9 | | | | | |

Figure 1: This macro converts serial date values assigned the Long International format in cells 12 spaces wide into labels.

■ SPREADSHEET CLINIC

ments in cells B1, B2, and B3 assign the name SOURCE to the current cell (originally, the cell at the top of the column of date values). The statement in cell B4, {Contents SOURCE,SOURCE}, converts the date value in the current cell (SOURCE) with a label. This label will be a "snapshot" of what was displayed in the cell at the point of the conversion. It will contain as many characters as the cell is wide. If the cell is wider than it needs to be to display the formatted date, the resulting label will have one trailing space and one or more leading spaces.

In the present example, the formatted dates contain 8 characters and are situated in cells that are 12 characters wide. Consequently, each label will have three leading spaces and one trailing space. The statement in cell B5, {Edit}{BS}{Home}{Right}{Del} 3-, strips these leading and trailing spaces from the label.

The next statement in the macro moves the cell pointer down to the next cell in the column of date values. If that cell is blank, 1-2-3 will exit from the macro. If it is not blank, 1-2-3 makes another pass, converting the date value in that cell into a label.

Paul J. Hurm
Hamilton, Ohio

The statement in cell B5 unfortunately limits this macro to converting date values in a specific format (in this case, Long International) in cells of a particular width (in this case, 12 spaces). To use the macro to convert date values in other formats and/or columns of different widths, you would have to modify that statement. For example, to convert date values in the Date #1 format (which produces a nine-character result) in a column 11 spaces wide, you would use the statement

```
{Edit}{BS}{Home}{Right}{Del}-
```

You can make the macro "universal" by putting the statement

```
{Let SOURCE,@TRIM(SOURCE)}
```

into cell B5. This statement replaces any label in SOURCE with a version of that label from which all leading and trailing spaces have been stripped, no matter how many there are.

As an additional refinement, you can speed up the macro by using the single

■ 1-2-3's @TRIM function strips any trailing (and leading) spaces from a string.

statement {rcSOURCE}{BS} - instead of the three statements in cells B1..B3 to assign the name SOURCE to the current cell.

ERRONEOUS @IRR RESULTS

I recently encountered a situation in which Symphony's @IRR function returned an erroneous value. Figure 2 shows a simplified version of the worksheet that contains this problem. As you see, cell D1 contains the value -26760, which is the initial cash outflow. Cells D2..D20 contain the subsequent cash inflows.

Cell B1 of the worksheet contains the function @IRR(B3,D1..D20). If cell B3 contains a "guess" value of 100.08 percent or below, as shown in Figure 2, the function returns the value -100 percent; if cell B3 contains a value from 100.09 percent up to 100.87 percent, the function re-

turns the value ERR. If cell B3 contains a value greater than or equal to 100.88 percent, the function returns the correct result: 111.4 percent. Can you explain this strange behavior?

C. J. Matthews
Casper, Wyoming

Sorry, Mr. Matthews. We know that the @IRR function returns the value ERR when it cannot pinpoint an internal rate of return within 20 iterations. However, we've never seen a situation in which it returns an erroneous negative value. This result is probably due to the particular formula that Lotus uses to compute internal rates of return. If anyone knows what that formula is and can explain why it produces a result of -100 percent in this example, please let us know.

TRAILING + AND - SIGNS

My company's mainframe computer stores numbers with trailing + or - signs. For example, it stores the value 1000 as 1000+ and stores the number -1000 as 1000-. After I import these numbers into 1-2-3, I parse them so that the values are in one column and their signs are in the next one. Consequently, all the numbers appear as positive values to 1-2-3.

After parsing the numbers, I use the

| | A | B | C | D |
|----|-------|---------|---|------------|
| 1 | IRR: | -100.0% | | (\$26,760) |
| 2 | | | | \$29,561 |
| 3 | GUESS | 100.00% | | \$38,397 |
| 4 | | | | \$38,021 |
| 5 | | | | \$29,720 |
| 6 | | | | \$29,480 |
| 7 | | | | \$29,287 |
| 8 | | | | \$29,201 |
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| 10 | | | | \$29,201 |
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| 13 | | | | \$28,517 |
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| 17 | | | | \$28,517 |
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Figure 2: The @IRR function in this worksheet sometimes returns erroneous negative values.

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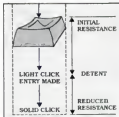
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macro shown in Figure 3 to identify the numbers with trailing minus signs and convert them into negative values. This macro steps down through the column of + and - signs, one cell at a time. If it finds a cell that contains a + sign, it moves the cell pointer down to the next cell and loops back to the beginning of the macro. If it finds a - sign, it converts the value in the cell to the left of that sign to a negative value. To do this, it enters the formula

```
@CELLPOINTER("contents")*-1
```

into the cell, then calculates that formula

while it is on the Edit line to convert it to its current value. After locking this value into the cell, the macro moves the cell pointer one cell to the right (back into the column that contains the + and - signs), moves down one cell, and then loops back to the beginning of the macro. J-2-3 cancels the execution of the macro as soon as it reaches a blank cell.

Mark Schoenfeldt
Wausau, Wisconsin

This method certainly does the trick, but it might be a better approach to use the state-

ment {Edit}{Home}-- instead of using the statement

```
*@CELLPOINTER("contents")*-1(Edit){Calc}
```

in cell B4 of Mr. Schoenfeldt's macro. This statement converts the values with trailing minus signs into negative values by typing negative signs in front of them. It works more efficiently than entering an @CELLPOINTER in the cell and multiplying by -1. You'll find that the macro runs about 25 percent faster if you use this alternative approach.

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| | A | B | C | D | E | F | G |
|---|----|---|---|---|---|---|---|
| 1 | \a | | (If @CELLPOINTER("type")="b"){Quit} | | | | |
| 2 | | | (If @CELLPOINTER("contents")="+"{Down}{Branch \a} | | | | |
| 3 | | | {Left} | | | | |
| 4 | | | @CELLPOINTER("contents")*-1(Edit){Calc} | | | | |
| 5 | | | {Right}{Down}{Branch \a} | | | | |
| 6 | | | | | | | |

Figure 3: This macro converts numbers with trailing - signs into negative values.

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PRODUCTIVITY

■ USER-TO-USER

```
100 ' Program to create CLICKER.COM -- by John P. Soh1
110 CLS:PRINT "Checking DATA; please wait..."
120 FOR B=1 TO 12:FOR C=1 TO 16:READ A$:T=T+VAL("6H"+A$):NEXT
130 READ S:IF S<>T THEN PRINT "ERROR IN LINE":B=16+100:END
140 T=0:NEXT:RESTORE
150 OPEN "CLICKER.COM" AS #1 LEN=1:FIELD #1,1 AS D$
160 FOR B=1 TO 12:FOR C=1 TO 16:READ A$
170 LSET D$=CHR$(VAL("6H"+A$)):PUT #1:NEXT:READ DUMMYS:NEXT
180 CLOSE:PRINT "CLICKER.COM CREATED"
190 DATA E9,92,00,0D,0A,43,4C,49,43,4B,45,52,20,69,6E,73,1273
200 DATA 74,61,6C,6C,65,64,20,2D,2D,20,4A,6F,60,6E,20,50,1295
210 DATA 2E,20,53,6F,60,6C,0D,0A,43,74,72,6C,2D,41,6C,74,1246
220 DATA 2D,49,6E,73,20,74,6F,67,67,6C,65,73,20,63,6C,69,1476
230 DATA 63,6B,20,6F,66,66,2F,6F,6E,0D,0A,24,FF,00,00,00,1135
240 DATA 00,FB,50,E4,60,AB,00,75,36,3C,1D,74,32,3C,38,74,1609
250 DATA 2E,3C,2A,74,2A,3C,36,74,26,3C,52,75,12,B4,02,CD,1230
260 DATA 16,24,0C,3C,0C,75,00,2E,76,16,4C,01,EB,09,90,2E,1092
270 DATA F6,06,4C,01,FF,74,00,E4,61,24,FE,34,02,E6,61,50,1792
280 DATA 2E,FF,2E,4D,01,BA,03,01,B4,09,CD,21,B4,35,B0,09,1460
290 DATA CD,21,2E,09,1E,4D,02,2E,0C,06,4F,01,B4,25,B0,09,1203
300 DATA 8D,16,51,01,CD,21,8D,16,95,01,CD,27,00,00,00,00,1040
```

Figure 2: BASIC CLICKER.BAS program to create CLICKER.COM.

of the Shift keys, the Ctrl key, or the Alt key, and it passes all keys through unaltered.

To change the hotkey toggle, change the variable hotkey in the CLICKER.ASM equate area to be the scan code of whatever key you use. Since the Ins key is right next to the Del key, there's

timbre changes depending on whether it's been installed an odd or even number of times.

John P. Soh1
Canoga Park, California

We receive lots of keyclick programs, but this one's different since you can toggle it on and off. Be careful if you try using it with SideKick or any other program that's greedy about Int 9.

■ To change the hotkey toggle, change the variable hot-key in the CLICKER equate area to be the scan code of the key you want to use.

an obvious risk in getting Ctrl-Alt-Del when you just want to turn off clicking. Remember that since CLICKER starts clicking as soon as it is installed, you may never need to use the hotkey toggle.

CLICKER does not check to see if it is installed already, so it's possible to invoke it more than once. Interestingly, the click

PATH MAGIC

Just about every hard disk user ends up battling the DOS PATH. Since many users keep data directories one level down from the programs that use the data, one way to make life easier is to include a "... in your PATH. My own PATH begins with D:\...C:\, so DOS can always try to look one level higher no matter where I am in the subdirectory structure.

But what users really need is a PATH editor to let them add or remove subdirectories temporarily. I've created a series of batch files to do just that. To use them, simply type the following all on one line with a single space after SUB DIR:

```
[d:] [path] CHPATH SUBDIR
[-B | -E | -DB | -DE]
```

where [d:] [path] CHPATH is the name of

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■ USER-TO-USER

CHPATH C:\222 -DB

you'd end up with C:\333;C:\444;. If you started with the same C:\111;C:\222;C:\333;C:\444; and you entered

CHPATH C:\222 -DE

you'd end up with just C:\111.

You'll actually need all three batch files in Figure 3: the main CHPATH.BAT, CPSET1.BAT (whose only purpose is to invert the order of the PATH entries), and CPSET2.BAT to handle the trickier delete-to-beginning and delete-to-end operations.

Timothy L. Burt
Tampa, Florida

These are all very useful—and sorely needed—utilities. About the only drawback is that when you want to delete subdirectories, you have to type them uppercase, exactly the way they appear in the

PATH. So if a subdirectory is C:\SK and you type in c:\sk or just \SK, it won't work properly. You should also note that, as the programs are currently written, you will

■ When you want to delete subdirectories, you have to type them uppercase, exactly as they appear in the PATH.

be unable to use the delete-to-end or delete-to-beginning functions successfully if you have more than nine subdirectories in your PATH.

We adapted the batch files to make

them case insensitive and added a new -I command to let you remove a single subdirectory inside the current PATH. If your current PATH is C:\111;C:\222;C:\333;C:\444; and you entered

CHPATH C:\333 -I

you'd end up with just C:\111;C:\222;C:\444;. We also added a line in CHPATH.BAT that creates a file called RESET.BAT. To reset your PATH the way it was before you made any changes, just type RESET.

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■ POWER USER

```

SET TALK OFF
CLEAR
FOR 1 TO 8, row, col
DO WHILE n<256
  @ row, col SAY STR(n,3) + " +CHR(n)
  n=n+1
  row=row+1
  IF row=25
    row=1
    col=col+7
  ENDIF
ENDDO
WAIT **

```

Figure 2: SHOWCHR.PRG displays the full IBM character set.

CHR() number. I find it especially useful with the hard-to-remember graphic characters.

Of course, various utilities like *SideKick* will also do this, but they tie up memory space, and I find it quicker to enter DO SHOWCHR than to dig through a manual.

Ralph H. Swedlow, M.D.
Sacramento, California

Don't you hate thumbing through the appendix of a manual just to find an ASCII number? And isn't everyone looking for an excuse to kick SideKick out of their AUTOEXEC.BAT?—Brad Stark

dBASE TO WORDPERFECT

I've developed a nonprogramming technique for translating *dBASE III* data directly into a format that *WordPerfect* can use for merging letters.

WordPerfect requires a Ctrl-R ('R') at

■ Because of character spacing, boxes on the screen become elongated rectangles on the printer.

the end of each field and a "E" between records. Each field must also be on its own line. I use *dBASE*'s LABEL FORM generator to create both the text and the delimiters for *WordPerfect*.

In *dBASE*, select single-column labels. The number of lines per label depends on how many fields you will be transferring.

At the end of each line in the *dBASE* LABEL FORM, concatenate a CHR(18) to generate the "R. To delimit each record, add a CHR(5), which produces the "E. TRIM all fields to ensure that trailing blanks are removed. For example:

```

1 TRIM(fname)+CHR(18)
2 TRIM(lname)+CHR(18)
3 TRIM(street)+CHR(18)
4 TRIM(city)+", "+state+CHR(18)
5 TRIM(zip)+CHR(18)+CHR(5)

```

To create the merge file, direct the LABEL FORM output to an ASCII text file with the command

LABEL FORM filename TO FILE filename

dBASE will add .TXT as the text file extension unless you specify otherwise.

There is one final step in *WordPerfect* before running the merge. I found that *dBASE* inserts an extraneous blank space between the "R character and the hard return when it creates the text file. (This is not a problem if you use *FoxBASE Plus*.) These extra blank spaces will cause the merge to fail. The easiest way to remove them is to do a global replace in *WordPerfect*. To do this, enter Alt-F2, and respond to the "search for" and "respond with" questions with

```

<F9><SPACEBAR><ENTER>
<F9><ENTER>

```

Andrew Coupe
Wheaton, Maryland

Mr. Coupe's approach has the added benefit of creating a dBASE .LBL file that can be run again as needed. In testing this technique in dBASE III and III Plus, I did not encounter the problem of an extra space; instead, I found that both versions added an extra blank line at the beginning. My suggestion would be to look at the merge file dBASE produces and go from there.

An alternative approach that also works for dBASE II involves issuing the command

COPY FIELD field list to filename DELIMITED

Separate fields in the field list with a comma. This command produces an ASCII text file with each field delimited by a comma, each record delimited by a carriage return, and each character field further de-

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■ POWER USER

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| | |
|------------------|------------------------------------|
| <Ctrl-F10> | Begin macro definition |
| <Alt-V> | Call it Alt-V (comes after Alt-U) |
| <Home><Home><Up> | Go to the top |
| <Alt-F2>N | Search and replace, no confirm |
| <F8><F8><F8> | Begin underline, end, begin again |
| <Left><Left><BS> | Delete the initial begin underline |
| <F2> | Search for [u]Underline] |
| <F2> | Replace with nothing |
| <Ctrl-F10> | End macro definition |

Figure 3: Undesirable underlining codes (see text) and a WP macro to strip them.

limited by single quotes in dBASE II and double quotes in dBASE III.

Then use WordPerfect's Convert utility. When asked for the delimiter, enter a comma; when asked for the character to strip, enter a double quote mark (") if the file comes from dBASE III (or III Plus) or an apostrophe (') if you converted the file from dBASE II.—Brad Stark

UNDER AFTER

Underlining existing text in WordPerfect is something I have to do frequently, but it isn't very easy. You have to define a block beginning and end, then hit the underline key. Wouldn't it be nice if you could hold down a single key that would advance the cursor through the text, underlining as it goes? The following simple macro does that.

| | |
|------------|----------------------------|
| <Ctrl-F10> | Begin macro definition |
| <Alt-U> | Call it Alt-U |
| <Alt-F4> | Block on |
| <Right> | Make a one-character block |
| <F8> | Underline the block |
| <Ctrl-F10> | End macro definition |

Hold down Alt-U and the cursor moves through the document, underlining existing text. As you reach the end of what you want to underline, you should tap <Alt-U> rather than hold it down so you don't overshoot. By changing the F8 line in the macro to another command that modifies a block, you can make macros that advance the cursor through the text making it, e.g., boldface or uppercase.

Dave Tocus
Gaithersburg, Maryland

This is a clever idea, but it leaves your document loaded with underline codes. If you underline the word "Underline" with Alt-

U and then look with "Reveal Codes," you'll see the display shown in the upper part of Figure 3.

The big [U] is the code to begin underlining, and the small [u] is the code to end it. You need to remove those [u][U] pairs afterward. The lower portion of the figure

■ WordPerfect requires a Ctrl-R (^R) at the end of each field and a ^E between records.

presents a macro to strip the codes for you. The macro will go through your whole document, eliminating the unnecessary "end underline/begin underline" pairs. After Alt-V, the line at the top of Figure 3 will read

[U]Underline[u]

This makes for a rather smaller file.
—Neil J. Rubenking

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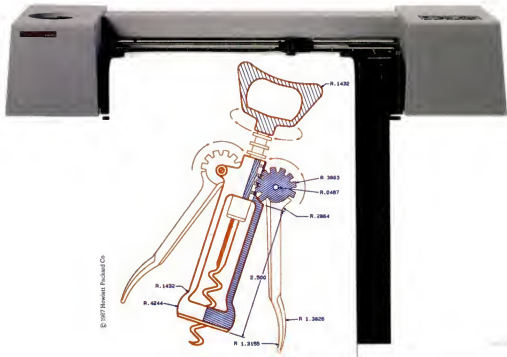
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LANGUAGES

Getting Turbo Pascal to lend unsigned integers its full support; a BASIC program that dumps EGA screens into a LaserJet; making Turbo procedures into external files.

BASIC

EGA SCREEN PRINTING

Because the screen memory on an EGA display adapter is stored in contiguous memory (as opposed to the odd/even arrangement used by the CGA), it is fairly simple to do a high-resolution screen dump to an HP LaserJet printer. However, most approaches using BASIC involve multiple loops to PEEK at the display memory, which takes a long time.

The EGA screen routine listed in Figure 1 takes advantage of two shortcuts to copy a full screen very quickly. First, BSAving the screen image to disk occurs extremely fast, even though it will require subsequent processing to add the HP graphics commands. Second, by using Shell, the final downloadable file can be copied to the printer directly through DOS, thereby avoiding LPrint, which is also slow.

Carl A. Popolo
Lexington, Massachusetts

Mr. Popolo's original program cleverly used BSAve to bypass a bunch of slow Peeks, but it didn't go far enough. I rewrote it as a callable subprogram and speeded things up by using BLoad to get the BSAved data into a string.

This is a very powerful technique that is often overlooked. When you need to save or retrieve all of the data in a numeric array, don't write it to a sequential file using Print statements. A much better approach is to BSAve a memory image of the data onto disk. When your program needs to retrieve the information later, simply dimen-

```
Screen 9
For X = 1 To 150 step 2.5           'display a test pattern
  Line(X + 300, X) - (300-X, 300-X), 7, B
Next
Call EGA.HP
End

Sub EGA.HP Static

  EGALength = 28000                 'size of EGA memory
  Def Seg = &HAA000                 'EGA screen segment
  BSAve "Tmp.Tm1", 0, EGALength     'BSave the screen image

  E$ = Chr$(27)                     'Escape
  Hdr$ = E$ + "&#75R"                '75 dpi resolution
  Hdr$ = Hdr$ + E$ + "&#r1A"         'initialize graphics

  EGADat$ = Space$(EGALength)       'room for screen image
  Def Seg
  BLoad "Tmp.Tm1", SAdd(EGADat$)   'BLoad it into EGADat$

  Open "Tmp.Tm2" As #99 Len = 86    '99 should be safe number
  Field #99, 6 As Start$, 80 As Dat$
  LSet Start$ = E$ + "&#80W"         'start graphics command

  For X = 1 To EGALength Step 80    'create the image file
    LSet Dat$ = Mid$(EGADat$, X, 80)
    Put #99
  Next
  Close #99

  LPrint Hdr$;                      'LPrint header directly
  Shell "Copy Tmp.Tm2/B LPT1: >NUL:" 'copy the data
  LPrint E$ "&#xB" E$ "&#E";          'end-of-graphics + reset

  Kill "Tmp.Tm?"                    'delete temporary files

End Sub
```

Figure 1: A BASIC subprogram to print EGA graphics on an HP LaserJet.

■ LANGUAGES

```
Open FileName$ As #99 Len = 1      'open to get the length
ReDim Array$(Lof(99) / 2)          'calc array size, each
Close #99                          'element holds 2 bytes
Def Seg                             'use default segment
BLoad FileName$, VarPtr(Array$(0)) 'load the data
```

Figure 2: BASIC's BLoad is much faster than using Input.

sian an array, find where it is in memory, and BLoad the file there.

The example in Figure 2 determines the correct array size and then loads some previously saved data.

Print and Input are two of BASIC's slowest commands, and any excuse to avoid them is warranted. A BSaved array can be written to disk more than 20 times faster than a file created using Print # statements. And though text files can't be BSaved or BLoaded like numeric arrays, writing a random file with LSet and Put will also be much faster than using Print.

—Ethan Winer

TURBO PASCAL

ADDING EXTERNAL PROCEDURES

I read an ad for a program called *Turbo Optimizer* that claimed it could save compiled Turbo Pascal procedures to be used later as external procedures. I thought this was a great idea, so I took a few minutes to implement my own version.

■ Print and Input are two of BASIC's slowest commands, and any excuse to avoid them is warranted.

The example program in Figure 3 finds the beginning of the procedure and the start of the dummy procedure that follows it using the Ofc function. That portion of the code is then written to disk.

There are limitations to using this technique. The extracted procedure cannot call other procedures because it no longer

knows where they will be. It can use global variables, but they must be declared at the beginning of the new program in the exact order they were declared in the original program. The external procedure must be the first procedure in the new program.

You could modify this technique to allow more than one procedure in the exter-

nal file. Turbo Pascal does this with the GRAPH.P and GRAPH.BIN files.

I salute the *Turbo Optimizer* people for this inspiration. My only question is, why didn't anyone think of it sooner?

William R. Haselton
Lynn, Massachusetts

This technique doesn't replace the Turbo Object Librarian, but it can save compile time. It is easy to add more procedures to the external file—I took the liberty of modifying the sample program to do just that. You need the offset in bytes from the start of the first procedure to the start of each of the others. In this case, there's just one other and it begins 170 bytes after the first.

```
PROGRAM ExternalFileCreator;
VAR
  X : Integer;
PROCEDURE ExternalProc(P : Integer);
(* THIS procedure will be made external *)
BEGIN
  Write('I am the famous External Procedure. ');
  WriteLn('called with parameter ', P);
  WriteLn('I know that global variable X has value ', X);
END;

PROCEDURE OtherProc(P : Integer); (* THIS procedure will be made external *)
BEGIN
  WriteLn('OtherProc is now calling ExternalProc');
  ExternalProc(P);
END;

PROCEDURE Dummy; BEGIN END;
(* Dummy procedure to mark the end of the ExternalProcedure. *)

PROCEDURE SaveExternal;
CONST
  BufferSize = 1000;
VAR
  Start, Finish : Integer; (addresses)
  Size : Integer;
  Buffer : ARRAY[0..BufferSize] OF Byte;
  Target : FILE;
BEGIN
  Start := Ofc(ExternalProc);
  Finish := Ofc(Dummy);
  Size := Finish - Start;
  IF Size > BufferSize THEN
    BEGIN
      WriteLn('Procedure is too big. ');
      WriteLn('Buffer is ', BufferSize, ' bytes. ');
      WriteLn('Procedure is ', Size, ' bytes. ');
      Halt;
    END;
  Assign(Target, 'EXTERNAL.SIN');
  WriteLn('Writing output to EXTERNAL.SIN');
  Rewrite(Target, 1);
  Move(Hex(CDec(Start)), buffer, size);
  BlockWrite(Target, buffer, Size);
  Close(Target);
  Write('Offset of "OtherProc" is ');
  WriteLn(ofc(OtherProc) - Start);
END;

BEGIN
  SaveExternal;
END.
```

Figure 3: Program to make two procedures into an external file.

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■ LANGUAGES

```

FUNCTION CardFloat(Num : Integer) : Real;
BEGIN
  CardFloat := 256.0*Val(Num)+Lo(Num);
END;

FUNCTION CardStr(Num : Integer) : Str5;
VAR
  Temp : Str5;
BEGIN
  Str(CardFloat(Num)+0.0, Temp);
  CardStr := Temp;
END;

BEGIN
  WriteLn('DEMONSTRATION of Cardinal Integer operations. ');
  WriteLn;
  WriteLn('When prompted for an integer, you may enter a decimal number. ');
  WriteLn('from 0 to 32,767, or a HEX number from 00 to $FFFF. Enter ');
  WriteLn('0 for both X and Y to quit the demonstration. ');

```

```

REPEAT
  WriteLn;
  Write('Enter POSITIVE Integer X: '); ReadLn(X);
  Write('Enter POSITIVE Integer Y: '); ReadLn(Y);
  IF (X = 0) AND (Y = 0) THEN Halt;
  WriteLn('Using ordinary Turbo Pascal functions, these are the results: ');
  WriteLn('Signed values: X = ', X, ' Y = ', Y);
  WriteLn('X > Y is ', X > Y);
  WriteLn('X < Y is ', X < Y);
  WriteLn('X mod Y is ', X MOD Y);
  WriteLn('X div Y is ', X DIV Y);
  WriteLn('Using cardinal functions, these are the (current) results: ');
  WriteLn('Cardinal values: X = ', CardVal(X), ' Y = ', CardVal(Y));
  WriteLn('X > Y is ', CardVal(X, Y));
  WriteLn('X < Y is ', CardStr(X, Y));
  WriteLn('X mod Y is ', CardMod(X, Y));
  WriteLn('X div Y is ', CardDiv(X, Y));
  WriteLn;
  UNTIL False;
END.

```

(Figure 5 ends)

operators +, -, *, and the bit operators give accurate results with cardinals, but DIV, MOD, and the comparators (except =) all needed rewriting. I have also written the equivalents of the functions Str, Val, and conversion to real. The CardVal function allows decimal literals, and CardStr converts cardinal integers to strings.

D.A. Johns
Gainesville, Florida

The basic technique behind Mr. Johns' routines is to treat the two bytes of the integer separately. Turbo Pascal's BYTE data type (which is specified for the variables I and Posn in function CardVal) exists strictly as an unsigned type, from 0 to 255. By using byte operations on the high and low bytes of the integer, he forces TP to treat the integer as unsigned.

—Neil J. Rubenking

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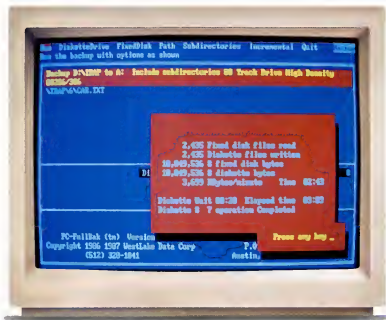
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■ EDITED BY ROBERT L. HUMMEL

PC TUTOR



A TUTORial on the VERIFY option; getting DIP switches to click with logical drives; formatting double-density disks at high density; precision numbers in BASIC.

CHECKING UP ON VERIFY

The DOS VERIFY option often confuses readers, who wonder whether running their systems with VERIFY on actually does anything. They also want to know if their word processor, database, and spreadsheet programs take advantage of whatever protection VERIFY provides. Well, as the old joke says, there's some good news and some bad news.

The good news is that yes, because most applications do their file handling by culling DOS functions, the VERIFY option is invoked whenever data is written to the disk. The bad news is that turning the VERIFY option on in DOS actually does little more than slow down your disk operations.

Unlike many DOS commands, the syntax of the VERIFY switch is easy to understand. You turn it on with the command VERIFY ON, and off with VERIFY OFF. Entering VERIFY with no argument displays the current status. But while the syntax is fairly obvious, the effect of the command isn't.

Common sense would lead you to expect VERIFY to make sure that the correct data had been written to the disk. A logical procedure for the operation might be: write the data to the disk, read it back from the disk, and compare the returned data with the original. If it isn't the same, retry the operation a specified number of times. If the process continues to be unsuccessful, signal an error. Logical as this seems, in reality, it doesn't happen that way.

One of the reasons for creating DOS (Disk Operating System) was to free application programs from the burden of hav-

ing to include code for handling disk I/O directly. Consequently, most programs interact with the disk by going through DOS. DOS, in turn, accesses the disk hardware through the BIOS (Basic Input/Output System)—a collection of hardware-specific subroutines. Without getting bogged down in details, a general look at three BIOS disk functions used when copying files will shed some light on the operation of the DOS VERIFY switch. These functions are read, write, and verify.

Consider what happens when you save a file from inside an application program. The program first calls DOS with the request to save the file. DOS must then move the data, which is stored in a buffer in memory, to the disk. This is accomplished by providing the correct parameters to the BIOS disk write routine. The BIOS, in turn, sends the correct commands to the disk controller. Before the data is written onto the disk, however, some additional information is appended. This extra infor-

mation is used to detect errors, and it is written to the disk at the same time as the data. The most common addition is called the Cyclic Redundancy Check (CRC), which we can consider a sophisticated type of checksum. The same data will always generate the same CRC. So, by calculating the CRC and writing it to the disk along with the data, two independent representations of the same data are recorded.

The read function is simply the reverse of the write function. It causes data to be transferred from the disk to a memory buffer. Each time the data is read, however, the CRC is again calculated and compared with the CRC that was recorded when the data was originally written. If the two CRCs match exactly, the data is assumed to be correct and is copied to the buffer. If not, the operation may be retried several times. But if the old CRC and the new CRC still don't match, the BIOS reports an error and does not return the data. (I'm using a little hand-waving here by lumping the BIOS and the disk controller together for the purpose of this discussion. In fact, the disk controller itself can actually detect and correct certain errors, which provides one more level of defense. But that's another column.)

The verify function operates nearly identically to the disk read operation, except that no data is moved to a buffer, even if the read is successful. VERIFY causes the data to be read from the disk and the CRC to be recalculated. The new CRC is compared with the old CRC to ensure that they match. Again, typically, if they don't match, the operation is retried a specified number of times, and then an error is re-

■ The bad news is that turning the VERIFY option on in DOS actually does little more than slow down your disk operations.

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■ PC TUTOR

turned. The important thing to note is that at no time is the data actually on the disk compared with anything. Thus, the verify function serves simply to check the continued readability and integrity of the disk, not of the data.

When you turn on the DOS VERIFY switch, a flag is set inside DOS. From then on, each disk write operation that DOS is requested to perform is immediately followed by a similar call to the verify operation. In other words, DOS checks to see that the area of the disk it just wrote your data to is readable—not that it wrote the correct data! Excluding bad sections, each normal area of a disk always has a valid CRC. If the data your program tried to write was somehow sidetracked into the Twilight Zone and never made it to the disk, the verify call would still return a good value, and DOS would never know.

VERIFY has an additional effect as well. The disk drive hardware must always wait for the correct area of the disk to rotate under the head, read the data, and calculate the CRC. The new CRC must then be compared with the recorded CRC. All this takes a finite amount of time. In the case of disk access, an operation that might normally have been accomplished in a single rotation might take three or more to complete. So, as I said earlier, VERIFY's most obvious effect is to slow down disk I/O.

I've never operated my PC with VERIFY on, and I don't know any power users who do. But just because it's thumbs-down on VERIFY doesn't mean you should take a cavalier attitude toward your disk. So what's the best way to ensure data integrity on a disk? Just follow these simple rules:

- Run CHKDSK each day to verify the entire disk.
- Make daily backups of your important files.
- Periodically use a utility that checks the entire hard disk for errors. (One example is Charles Petzold's DISKSCAN.COM, PC Magazine, April 29, 1986.)
- Keep handy a utility that can undelete files and recover damaged ones.

WHITHER DRIVE B:?

I've got a mini-XT clone with a hard disk and one floppy drive. The trouble is, the machine doesn't know it doesn't have a

drive B:. The system hangs if I accidentally log on to B:. What's the best way around this?

Keith S. Wilkinson
Tokyo, Japan

This is one of those letters that has "something is wrong" written all over it. The situation you describe should not be happening. Fortunately, I believe it's easily solved. Check the DIP switch settings on the system board in your PC. If my hunch is correct, you'll find it set to indicate that two physical floppy drives are present. Since that's not the case, reset the switches to indicate one floppy drive.

DOS was born at a time when many computers had but a single physical disk drive. To allow operations such as copying files from one disk to another, DOS supported the concept of the logical drive. By using this method, a single physical device could be made to appear to be two separate devices from a system point of view.

In an XT-type system, such as yours, the BIOS reads the DIP switches to get the configuration information it passes to DOS. If the switches are set to indicate a single floppy drive, DOS makes note of that and creates two logical drive names, A: and B:, that map to the same, single floppy drive. If the switches indicate two floppy drives, the logical drive names map to different physical devices.

The diskette controller provided with your machine is probably a common model that can handle two or four drives, depending on its manufacturer. If you have one drive, but DOS believes you have two drives, accessing B: can cause problems. DOS will ask the controller to access the second drive, causing an error. Usually, the message "Not ready error reading drive B:." will appear on the screen, followed by "Abort, Retry, Ignore?"

BASIC NUMERICAL FORMATS

I was very interested in the SAFARI utility you presented in the PC Lab Notes column of November 10, 1987, so I typed in the BASIC listing that creates the utility. As I was checking my work, however, I noticed a discrepancy. When the CHECKSUM is a six or seven-digit number, such as 119555, an exclamation mark (!) appears appended to the number whenever I

do a LIST of the program. When eight or more digits are entered, a hash mark (#) is added. Why?

Clarence L. Middleton
Decatur, Illinois

I have to admit, this one caught me by surprise the first time I typed in a BASIC listing, too. But the explanation is fairly simple. The BASIC interpreter (BASIC, BASICA, or GWBASIC) supports four basic storage types: integer, single-precision, double-precision, and string. The integer type is 2 bytes long and can hold values between -32767 and +32767.

■ The dealer assured me, with a sly wink, that 360K disks were OK in the high-capacity drives.

These limits are derived from the method in which the number is stored. With 16 bits to work with, one of which is devoted to storing the sign of the number, the largest integer that can be represented is $+1-2^{15} - 1$. Because it's an integer format, no decimal point is allowed.

Once you exceed this boundary, BASIC automatically switches to its single-precision format. For this format, 4 bytes of storage are allocated for each value. The number itself is divided into two portions, a mantissa and an exponent. The mantissa holds the seven most-significant digits (farthest to the left as we would write them). No space is used to store a decimal point in the mantissa. The exponent portion gives the multiplication factor needed to reconstruct the original number.

For example, the number 32768 would be stored as 3.276800E+4, where 3.2768 is the mantissa and the E+4 is the exponent. In this case, it implies multiplying 3.2768 by 10^4 or 10,000. The largest integer that can be represented precisely in this format is 9.999999E+6, or 9999999. The largest number that can be stored is 1.701412E+38. Note that any digits after the seventh will be lost. To indicate that it

is using this format for internal representation, BASIC appends a "!" to the constant appearing in your program.

You can't store a bigger number, but if you need more digits, BASIC supplies the double-precision format and appends the #. It's nearly identical to the single-precision type, except it occupies 8 bytes in memory and allows up to 16 digits to be represented internally. The largest number allowed is 1.701411834604692E+38.

MORE ON FORMATTING

In the November 24, 1987, issue you answered a question about formatting high-density disks. There is another reason that a high reject rate can occur. The disk being formatted must be a high-capacity disk. Trying to format a "normal" 360K disk typically produces a large number of bytes marked as unavailable.

I know this seems obvious, but I solved a similar problem for a client by discovering that they were trying to format disks rated for 360K at 1.2MB.

Guy Scharf
Mountain View, California

The dealer from whom I bought my AT assured me, with a sly wink, that he always formatted 360K diskettes in the high-capacity drives in his machines. After trying one or two and hearing the disk head seek back and forth as it marked sector after sector as unusable, I knew better. I immediately put in an order for some high-capacity diskettes.

In my original response, I said to try the disks on another AT, and if the same problem occurred, suspect the disks. That didn't go far enough. My first question should have been, as I am indebted to Mr. Scharf for pointing out, "Are you using the correct disks?"

ASK THE PC TUTOR

The PC Tutor solves practical problems and explains points of general interest about using your hardware and software more productively, and answers basic questions about DOS and systems in general. To see your questions answered here, drop a line to PC Tutor, PC Magazine, One Park Avenue, New York, NY 10016. We're sorry, but we cannot answer questions personally.

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CONNECTIVITY CLINIC



Printing with 3Com's 3+Share without user mediation; putting together a tried-and-true general purpose LAN; assembling a WAN; and where to find LAN training courses.

LAN PRINTING TIP

In order to print a document to a networked printer using 3Com's 3+Share, it is necessary to either press Ctrl-Alt-PrtSc or exit to DOS in order for the server to close the spooled document and send it to the printer. Either procedure can be inconvenient for the end user.

If you are doing your own programming, the following process will close the print file and print it without any user intervention:

(1) Store the value 5D09 hex in the AX register.

(2) Issue DOS interrupt 21 hex.

Placed at the end of a print stream, this interrupt will close the print file and send it to the requested printer.

Ken Fields
West Covina, California

LAN FOR ALL SEASONS

We develop software for many different clients. They are installing a wide variety of LAN systems. We want to install a LAN with a good "generic" feel to it in our facility so that our software will operate on as many systems as possible. I assume that applications written under DOS 3.1 will run on any network that supports NETBIOS. What do you suggest?

Jeffrey Katz
New Bedford, Massachusetts

Your assumed link between DOS 3.1 and NETBIOS isn't necessarily there. Sometimes NETBIOS is provided by the network interface card manufacturer and sometimes it is emulated by higher-level

networking software, like Novell's NetWare.

Your letter suggests that you aren't going to write applications that specifically call NETBIOS functions. My suggestion for a software development system is the same "baseline" configuration we run in the Connectivity Labs: 3Com EtherLink cards running under Banyan's VINES, Novell's NetWare, and 3Com's 3+Share. You could also use 3Com's NETBIOS to run IBM's PC Local Area Network Program, Tapestry, or other programs on the same cards.

The drawback of this system is that you need at least two, and probably three, dedicated servers. The Banyan and 3Com operating systems also require a dedicated server. You might want to select the Entry Level Solution version of Novell's Advanced NetWare/286 system fault tolerant software. This version is limited to four users and has no internetwork bridging.

■ The Entry Level Solution version of Novell's Advanced NetWare/286 system fault tolerant software is limited to four users.

but it doesn't require a dedicated server and lists for only \$595.

If you are testing code written to NETBIOS, then I suggest three different types of networking cards (probably AT&T's StarLAN, 3Com's EtherLink, and the IBM Token-Ring Network) running under the appropriate NETBIOS and IBM's PC LAN software.

LAN COURSES?

We are flooded with brochures for LAN courses. We want some training but don't know which to pick. Any suggestions for good LAN training?

Barbara Dreher
Aurora, Colorado

For a LAN administrator, the courses given by the LAN operating system companies are best. We send people to the Novell and 3Com 3-day courses regularly and highly recommend them. Their courses are given at locations around the nation. For planners and managers, the choice is harder. Architecture Technology Corp. (phone (612) 935-2035) gives authoritative courses in different locations. I run courses on practical LAN solutions in the Washington, D.C., area. Call (703) 281-8640 for more information on those 1- and 3-day seminars.

FCC \$5 DOCKET—REVISITED

Your explanation of FCC Docket 87-215 (Connectivity Clinic, PC Magazine, October 27, 1987), concerning the increased cost for data calls, was excellent. However, several bulletin board systems in this

■ CONNECTIVITY CLINIC

area are urging that we complain about FCC Docket 87-208. Are they the same thing?

Phillip A. Greb
Austin, Texas

The number 87-208 is the serial number of the initial FCC press release. The FCC Docket you are concerned about (actually a notice of proposed rule making) is 87-215, as we stated. All of the letters on this

subject and the chance for publicity attracted the interest of Congress. If you have any original thoughts on the matter (and please read the explanation referenced above before you sign a form letter downloaded from a BBS), you might inform your elected federal representatives. It looks like Congress will put some spin on anything the FCC does.

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After reading the coverage of PBXs in

■ If I had to put together a WAN connected by telephone lines, I would select VINES as my operating system.

PC Magazine, I realize how sophisticated the data communications field is. I understand UNIX and database systems, but what can you suggest to link the PC-based LANs into a WAN with minicomputer connections?

Harry C. Russel, Jr.
Montgomery, Pennsylvania

First, Mr. Russel, go back and read the two reviews PC Magazine did of the DEC ("Making Connections: DEC Meets DOS," September 29, 1987) and AT&T ("Making Connections: AT&T's 3B2/6000 and StarLAN," October 27, 1987) products that use a minicomputer to provide file services to MS-DOS computers. But don't make a decision until you check with Banyan. Its VINES network operating system now runs under minicomputer operating systems. VINES has very strong asynchronous communica-

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tions capabilities. If I had to put together a WAN connected by telephone lines, I would select VINES as my operating system.

You have to do some studying to decide between using dialed-up lines, full-period leased telephone lines, or a public data network to hook together your systems. Since you are linking headquarters, it is possible that your voice telephone people already have "tie lines" (dedicated leased circuits) between the locations. They may also have special calling rates for dialed-up lines. If you use dialed-up lines you will save money, but will lose a minute or more on each call while you log in and start the application. Tymnet, Telenet, Accunet, CompuServe, and other public data networks can provide error-checked packet-switched connections between your locations.

However, you will have to develop a good estimate of your data load and shop carefully for the best prices. I think you should start with dialed-up lines. You want the fastest throughput possible over voice grade circuits. Consider the data compression products available from Hayes and others, but I know I would choose the Telebit TrailBlazer modem.

Telebit has some special ROMs that improve the throughput of the UNIX communications subsystem. You will probably run out of the capability to accept asynchronous data in the minicomputer before you will hit the throughput limit of the Telebit modems. This configuration should give you about 14K of throughput to a UNIX-based host over dialed-up voice-grade telephone lines.

NETWORK YOUR QUESTIONS

Connectivity Clinic gives you practical solutions to networking problems of all types. We'll pay \$50 or more for any tips we print, plus an extra \$25 if you submit your letter on a disk, and we'll gladly answer any questions you have, at no charge. We're sorry, but we're unable to answer letters personally.

Mail your contributions to Connectivity Clinic, PC Magazine, One Park Avenue, New York, NY 10016, or you may contact Frank J. Derfler, Jr., via MCI Mail (be sure to use Derfler's box named CONNECTIVITY CLINIC).

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The following special section, PC Magazine's Direct Marketing Connection, is what you've been demanding. It connects you with the direct marketers who are anxious to please you. By having them all in one place, you can quickly zero in on the products you need from the vendors you want to buy through.

*Starch Study, July 1986



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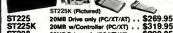
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★ **NEC** ★
 New MultiSync II Model 1402 569
P2200 Parallel Printer 339

★ **PLUS HARD CARD 20/40 ... 525/775** ★ **TOSHIBA 321SL/341SL ... 479/649** ★

| SYSTEMS | PRINTERS | MONITORS | DISPLAY CARDS |
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| NEC Multispeed EL 1549
Multispeed HD w/20 MB 2499
NEC 1200/2400 Int Model 2999
With Laptop 270/370
NEC Carrying Case 99
With Laptop 80
Extra Nickel Battery 99
With Laptop 80
TOSHIBA T1000 799
T1200 w/carry case 2199
T1200 w/carry case 2999
T1312/LC/TTY 319
Toshiba Ext 5.25" Floppy 379
With any Lap top 350
Toshiba 1200 Bc Int Model 359
With Laptop 350
Toshiba Floppy Link 169
With Laptop 150
T3100 Numeric Keypad 90
With Laptop 80
Toshiba Carry Case 99
With Laptop 70
Brooklyn Bridge 99/80
Laplink w/any Laptop 99/80
Laplink Plus w/any Laptop 109/90 | ALPS PRINTERS
• ALO 200 Color, Narrow 16
16 pin, 200/100 cps 419
24 pin, 240/120 cps 479
• ALO 300 Color, Wide 16
16 pin, 200/100 cps 619
24 pin, 240/120 cps 679
Tractor AL200/300 75/95
Ribbon ALO Black/Color 15/20
• P2000 9 pin, 250/125 cps, Wide 699
Ser & Par w/Tractor 699
24 pin, 360/180 cps 1129
Ser & Par w/Tractor 1129
• P2400 Color, Wide w/Tractor 16
pin, 250/125 cps 929
24 pin, 360/180 cps 979
CITIZEN 15/25 299/369
Sheet Feed w/Printer 170/140
• DICOMIX 150 Inkjet Parallel w/3 custom cable 319
With any Lap Top 299
• NEC P2200 - Par 339
• P-8 Par 419
• C-P8 Color - Par 499
• P7 - Par 589
• P27 Color - Par 589
Uni-Di Tractor for P2/P8 60
Bi-Di Tractor for P2/P8 160
Uni-Di Tractor for P3/P7 70
Cul Sheet Feeder for P2/P20 120
Cul Sheet Feeder for P3/P7 230
Cul Sheet Feeder for P3/P7 290
• OKI DATA PLUS IBM 329
• 193 PLUS IBM 449
PANASONIC 1092 II-H 329
• 1592 369
• QUADLASER LS1101 1099
• TOSHIBA 321 SL 479
• 341 SL 649
KENSINGTON Printer Stand 10
w/Printer 10 | • LOGITECH AutoSync 499
With Logitech EGA & Mouse 699
With VEGA VGA Plus 759
With Paradise VGA Plus 799
With VEGA VGA 799
MITSUBISHI 1410 EGA 399
• ALUM 1371 Diamond Scan 479
With ATI VIP 759
With Everex EGA 759
With Genoa HiRes 679
With Paradise VGA Plus 819
With Paradise VGA Pro 819
With VEGA VGA 779
• Diamond Scan TIR & Swivel 15 589
• NEC MultiSync II-1402 589
With VEGA VGA 849
With Everex EGA 849
With Genoa HiRes 789
With Paradise VGA Plus 829
With Paradise VGA Pro 869
With VEGA VGA 869
• NEC MultiSync Plus 899
With ATI VIP 1179
With Genoa HiRes 1099
With Paradise VGA Plus 1159
With Paradise VGA Pro 1299
With VEGA VGA 1199
• SONY 13131R-13 Trinitron Color 70
• Remote T & RGB Monitor 499
• Sony 1311 to IBM Cable 70
• SONY Multiscan 1362 599
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With Genoa HiRes 799
With Paradise VGA Plus 869
With Paradise VGA Pro 899
With VEGA VGA 899
Sony 1302 to IBM Cable 70
Sony 1302 to MAC II Cable 30
• TAXAN 770 MultiVision plus 659
With 557 Gold Card 659
ZENITH ZCM 1490 Flat Screen 669
With VEGA VGA 1019
With Zenith Z-449 1019 | ATI EGA Wonder Enhanced 219
With Multi Scan Monitor 170
ATI VIP w/any Monitor 250
BOCA EGA w/any Monitor 179/150
EVEREX EVGA 329
With Multi Scan Monitor 280
GENOA SuperEGA HiRes 249
With Multi Scan Monitor 200
LOGITECH EGA Card & Mouse 299
Paradise VGA Monitor 250
NEC MultiSync GB-1 299
With Multi Scan Monitor 250
PARADISE VGA Plus 309
With Multi Scan Monitor 250
Paradise VGA Professional 449
With Multi Scan Monitor 400
TAXAN 557 Gold Card 199
With Multi Scan Monitor 160
VIDEO-7 Vega Deluxe 249
Paradise VGA Monitor 200
Vega VGA w/any Monitor 349/300
ZENITH Z-449 399
With Multi Scan Monitor 350 |

| SHOWN | KEYBOARD/MOUSE |
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| • All Drives Driven Are Internal
FUJITSU/TEAC 90 day warranty
360K/1.2 MB 99/129
Grey Face Plate - Add 5
SEAGATE: For PC/XT HALF HT
40 MB 1/2 H 20MB w/cont. cables &
partitioning software 569
• PRO PACK 20/30 MB 259/279
• Fully Pretested, PRO PACK includes
controller, cables, detailed &
illustrated 100 page manual and
format/utility sw. One year warranty.
PC/XT Mining Kit & Filler Plate 10
• For AT w/partitioning software 499
• 40 MB Half Ht 25 ms 499
• AT Mounting Kit 10 | KEYTRONIC 101 Keys for IBM PC, XT, w/Function Keys on top row, separate Cursor Control Keypad and Numeric Keypad 89
LOGITECH: Bus or Ser 79
All Logi. Mouse include PLUS Software
• PS/2 Mouse 79
Publisher Mouse: Ser or Bus 129
LogiPaint/LogiCadd 20/50
MICROSOFT Mouse Bus or Ser 119
• With Paint Brush & Show Partner 119
Version 5 or Higher 119
MOUSE SYSTEMS PC Mouse
• With Designer PopUp Menu 109
• • • LIFE TIME WARRANTY 109
Serial or Bus 109 |

★ **SEAGATE PRO PACK 20/30MB** 259/279 ★

| MATH/RAM CHIPS | ★ FREE DELIVERY ★ | SUPER SPECIALS |
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| 64K RAM 120 ns Set of 9 525
256K RAM 120 ns Set of 9 50
6807-3 PC/AT 145
6807-2 PC/AT 145
80267-6 AT 6 Mhz 169
80267-9 AT 8 Mhz 239
80267-10 AT 10 Mhz 289
80267-19 for 386 Machines 489 | • PREPAID ORDERS IN CONTINENTAL USA ONLY •
Simply mail the check for the exact amount (CA add 6%) as shown here with your order. We will ship your order UPS Ground. FREE of all other charges. If it is that simple (credit card orders are not considered prepaid). Bank check orders shipped immediately. Personal/Co checks delay shipment 2/3 weeks. | • PREPAID BY CHECK ONLY •
• POSTMARKED BY MAR 10, 1988 •
• AMT 20/30 MB 449
• MICROSOFT MOUSE Bus or Ser 79
• With Paint Brush & Show Partner 119
• Version 5 or Higher 119
• TOSHIBA 1200 w/carry case 2249 |

| FOREIGN ORDERS | COD • AMEX • OPTIMA • DISCOVER • MC • VISA | ★ APO • FPO ★ |
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| Special handling charge \$20 per order. Air shipments add 10% (Min \$50). For Printers & 30% (Min \$150). Some items may be more. Credit card orders add 5% amount owed. | POLICY Min order \$50. Prices & availability subject to change. Shipping charges vary. Prices reflect order for advance payment. Personal/Co checks delay shipment 2/3 weeks. Add 2% (Min \$5) for COD orders. C.O.D. & Visa and Amex & Discover & MasterCard or cash order. Cash order for showroom or walk-in sales. Open acct. PO cash order \$1000. call for special prices. All sales final unless stated otherwise. No returns. No exchanges. No cash back. No credit. No interest. No pickup hours. Mon-Fri 9-5 PM. Please call FIRST for WORKORDER. | Special handling charge \$20 per order. Shipping charges add 5% (Min \$20). For Printers & 30% (Min \$40). Some items may be more. No COD orders. |

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 PLEASE REFER TO # PC 619

Northgate 286 System that was awarded

**Computer Shopper Magazine's
1987 BEST BUY...JUST BECAME
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NEW 12MHz Clock Speed
60MB MiniScribe
FAST HARD DISK DRIVE

1 Full Megabyte
High Speed 120NS
Memory on The
Motherboard

2 Floppy Drives
and MS-DOS
GW BASIC

Includes
Northgate's Exclusive 101-key "C/T"
Click-Tactile Enhanced Keyboard!

Sold Direct-to-You at History-Making Low Cost with No Middle-Man Markups!

**FULL
SYSTEM
PRICE**



\$ 1999⁰⁰ complete

NOW...Northgate Brings You the Industry's Highest Performance Systems at Industry-Low Prices!

"E/T"™ Enhanced Technology Complete Systems

RLL HARD DRIVE ENCODING, 1:1 INTERLEAVING AND 2.5 TIMES FASTER DATA TRANSFER CONTROLLER = LIGHTNING FAST COMPUTING PERFORMANCE AT A PRICE OTHER COMPUTER VENDORS CAN'T MATCH!

If you're a first-time computer shopper, looking at all the ads, you're probably pretty confused. BUT...YOU KNOW YOU JUST CAN'T BUY A FULL AT SYSTEM FOR \$995.00 OR AN XT FOR \$349.00 AS OTHERS ADVERTISE. THAT'S LIKE A CAR WITHOUT WHEELS.

Don't be misled by the confusing "bare bones" or "basic system" pricing others use just to appear competitive. By the time you add up everything else you need, you'll end up paying more and probably getting just an **ordinary performance machine**. Knowledgeable computer buyers know that Northgate offers **Complete Systems that are truly different from the rest of the pack**. That's why **Computer Shopper** named Northgate's 286 as the 1987 BEST BUY IN COMPUTING. Now, Northgate's innovative design skills have created "E/T" Enhanced Technology Systems with even better performance and value.

Our proven method of RLL encoding super MiniScribe hard drives gives you 50% more hard drive storage for your money. A 1:1 Interleave is applied to the drives. This delivers data from the disk to the read-write heads 300 to 600% faster than the drive/controller combination most other competitors provide.

Northgate uses an OEM hard drive controller with data transfer rates up to four times faster than most competition.

The result is a true Power System with overall system performance at least 2.5 times that of systems using ordinary, off-the-shelf parts.

Northgate has developed a thoroughly reliable method of using RLL encoding on the hard drives in all our 286 "E/T" systems. In 80286 systems, this technology is unknown to most of our competitors. Call them! You'll be amazed to find almost none offer RLL drives in 286 systems. Some will even tell you it can't be done. Next, ask about vital through-put factors like controller data transfer rates and interleaving ratios.

Most competitors merely assemble a collection of parts so archaic as to actually degrade performance. The Drive/Controller combinations most others use have the effect of **harnessing a race horse to a plow**. Processor speed is wasted because controller transfer time is so agonizingly slow.



Northgate takes the confusion, uncertainty and guesswork out of buying your computer. Skillfully assembled, thoroughly tested, your Northgate system arrives fully configured, ready to plug together and use. And Northgate has designed the most thorough, easy-to-follow documentation that takes novice or professional from set-up to shut down.

WRITTEN IN ENGLISH!

We format and partition your hard drive to your specifications using advanced OnTrack Software which we even send with your system at no extra charge.

All these are the compelling reasons why Northgate Systems are used by: **Government Agencies**—FAA, EPA, DNR, USDOC, INTERIOR, USDA, NPS; **Fortune 500 Corporations**—RCA, Westinghouse, Intel, General Dynamics, Bell Southern, Dow Chemical, Honeywell and many more; **Colleges and Universities**—So. Cal., Duke, Iowa State, N. Car., S. Car., Mo., Harvard and more, as well as **thousands of small businesses and individuals worldwide**.

Add to all these features, the most meaningful Consumer Protection Policies in the computer industry (see next page).

So forget competition's bare bones prices and those just ordinary systems... **COMPARISON WILL PROVE NORTHGATE OFFERS MORE!**

STANDARD NORTHGATE SUPER/TURBO 286-60 "E/T" SPECIFICATIONS:

| | |
|--|----------------------|
| PROCESSOR | INTEL 80286 |
| PROCESSOR SPEED | 8/12 MHz 1 WAIT |
| MAKE OF BIOS | AWARD WSETUP |
| EXPANSION SLOTS | IN ROM |
| | 8 (TWO 8 BIT |
| | SIX 16 BIT) |
| STANDARD MOTHERBOARD MEMORY | 1 MEGABYTE |
| | 120NS |
| | YES |
| CO-PROCESSOR SLOT | YES WITH AA |
| CLOCK-CALENDAR | BATTERIES |
| | 2- 12MB AND 360K |
| NO. OF FLOPPY DRIVES | FUJITSU |
| (NOTE: 3 EXPOSED HALF HEIGHT DEVICES MAY BE INSTALLED) | 1 (SPACE FOR TWO) |
| BRAND OF FLOPPY | MINISCRIBE |
| NO. OF HARD DRIVES | MODEL 3650 |
| TYPE OF HARD DRIVE | 64.2 MEGABYTES |
| HARD DRIVE FORMATTED | USABLE |
| | SAMSUNG 12" |
| STD. MONITOR TYPE | AMBER TTL |
| | HERCULES |
| STD. VIDEO CONTROLLER | COMPAT 1 P.P. |
| | 1 P.P. 1 S.P. 1 G.P. |
| ADDITIONAL PORTS STANDARD | ENHANCED 101 |
| KEYBOARD TYPE | CLICK TYPE |
| | WITH HARD COVER |
| MS-DOS 3.2 & GWBASIC | MANUALS |
| | HAS CONTROL |
| CASE—FULL SIZE (NOT BABY AT) | PANEL, LEI'S AND |
| | SECURITY KEYLOCK |

SUPER/TURBO 286-60 "E/T" \$1999.00 SYSTEM PRICE COMPLETE

WITH ALL FEATURES ABOVE AND MINISCRIBE 32 MEGABYTE RLL HARD DRIVE SUPER/TURBO 286-60 "E/T" \$1899.00

| | |
|--|----------|
| OPTIONS—ADD: | |
| MINISCRIBE HARD DRIVES UP TO 380 MEGABYTES | CALL |
| SECOND SERIAL PORT | \$ 35.00 |
| 3.5 INCH FLOPPY SWAP FOR 1.2 OR 360 | \$ 98.00 |
| MATH CO-PROCESSOR CHIPS | CALL |
| COLOR GRAPHICS (CGA) MONITOR WCARD | \$295.00 |
| COLOR GRAPHICS (EGA) MONITOR WCARD | \$495.00 |
| MULTISYNC 14" MONITOR WCARD | \$695.00 |
| (VIDEO CARD IS AUTOTENSE TYPE) | |
| A \$240.00 RETAIL VALUE ALONE | |
| HAYES COMPAT. 1200 MODEM | CALL |
| HAYES COMPAT. 2400 MODEM | CALL |

**Use Our Toll-Free Order Number
800-548-1993**

CIRCLE 241 ON READER SERVICE CARD

AND FOR THE BEST BUY IN XTURBO "E/T" SYSTEMS...TURN THE PAGE

Northgate's V20/8MHz XTurbo Is Now Available with 65MB Hard Drive and the same "Enhanced Technology"



NOW...for the buyer who doesn't need 286 speed but wants an XT type system with through-put up to four times faster than other systems, Northgate offers its XTurbo/V20/8-65.

This system also features the MiniScribe hard drive and SMS high speed controller. It is furnished complete with:

V20 Microprocessor • 640K Memory on Motherboard • 360K Floppy Drive • MiniScribe 60MB FAST Hard Drive with 1:1 interleave • 8 Expansion Slots • 2 Parallel, 1 Serial Port, Clock-Calender, Game Port • Amber Screen TTL Graphic Monitor with Hercules Compatible Video Card • Northgate "C/T" Click-Tactile 84-key AT style keyboard • Case is the AT style with turbo button, keylock reset button and indicator lights. (Second Floppy Drive pictured is optional at additional cost.)

Complete System Price: \$1299⁰⁰

Same system with 30MB Hard Drive \$1149⁰⁰

NORTHGATE GIVES YOU THE MOST POWERFUL CONSUMER PROTECTION WARRANTY IN THE COMPUTER INDUSTRY...

30-Day Compatibility Warranty:

Northgate guarantees its systems will operate any standard, commercially available DOS programs written for use on IBM Compatible Computers. If, on consultation with Northgate, a program cannot be made to operate satisfactorily, owner may return the system, complete and unaltered for a prompt and full refund including all freight costs.

One-Year Overnight AT NORTHGATE

EXPENSE Parts Replacement Warranty:

Northgate Computer Systems warrants that all systems sold by Northgate will be free of defects in workmanship and materials for one year from date of shipment.

In the event of failure of a part that disables the system Northgate will ship, the same day if notified by 12 Noon Central Time, a new replacement part. Customer must phone Northgate Customer Service for diagnosis of the failure.

Shipment of the replacement part will be by overnight express service—AT NORTHGATE'S EXPENSE—for next day delivery depending on the carrier's ability to provide such service in owner's geographic area.

Owner must return any replaced part, complete and unaltered, and pay return shipping costs, to be received at Northgate within two weeks after receiving the replacement part. Northgate's Customer Service department will provide full instructions on making the repair or replacement and will consult with customer on the phone to assure repair is properly completed and the system is again operating.

CIRCLE 240 ON READER SERVICE CARD

In the case of a complete system returned for repair under warranty, customer pays freight to Northgate and Northgate pays return freight by whatever service the system is sent to Northgate.

In the event of a part replaced under warranty, the new part carries a NEW ONE-YEAR GUARANTEE FROM SHIP DATE!

NOTE: Many computer vendors extend only the parts manufacturer's warranty which may be as little as 30-days. All products sold by Northgate are fully guaranteed by Northgate for one year from date of shipment.

TERMS: Northgate accepts VISA and MASTERCARD charge cards with no surcharge. Purchase orders from established accounts, also accepted as well as COD (Cashiers Check) and Wire Transfer. Personal and Company Checks require 15 days to clear. APO and foreign orders accepted. All shipments are FOB Plymouth, MN. Delivery is subject to time required for order processing, manufacturing and 24 hour testing.

CONSUMER PROTECTION TIP TO PROSPECTIVE COMPUTER BUYERS:

When shopping, remember the Better Business Bureau Motto: "If it sounds too good to be true, it probably is." Exceedingly low prices are your first warning.

Most computer direct sales firms are trustworthy. BUT, better to be safe than sorry.

BEFORE YOU PLACE YOUR ORDER, PHONE THE BETTER BUSINESS BUREAU OFFICE IN THE VENDOR'S AREA. (Your local BBB will give you the phone number for the appropriate office.)

Use our Toll-Free Order Number 800-548-1993

Hours: M-F
8 a.m. - 7 p.m.
Central.
Sat. 9-2



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NCR GUARANTEE
We will never knowingly disappoint you. If for any reason your purchase does not give you complete satisfaction, the full purchase price will be cheerfully refunded immediately upon return of the merchandise.

We have always believed that no sale is complete until the customer has received total satisfaction from our products.

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We manufacture our products with the finest matrix inks, premium high density nylon, precision engineered plastics and "Rem" air refrigerated loading equipment.

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| 104- | Canan A-1200 | 4.50 |
| 113- | Centronics 150/152 | 2.25 |
| 109- | Centronics 350/351/352/353 | 8.50 |
| 112- | Centronics 704/705/753 | 4.50 |
| 169- | Citizen MSP 10/20 | 2.50 |
| 167- | Citizen MSP 15/25 | 3.50 |
| 114- | C. Ito 1550/7500/8510 | 2.95 |
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| 1310- | Data Products B-300/500 | 4.95 |
| 237- | Data Products B-800/1000 | 6.50 |
| 135- | Data Royal 5000 | 2.60 |
| 135- | Data South 180/220/5180 | 2.60 |
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| 114- | Dec LA 50 | 2.95 |
| 156- | Diablo 1660/2300 Matrix | 3.50 |
| 153- | Diablo Hylite II Nylon | 2.95 |
| 280- | Epson EX 800/1000 | 4.20 |
| 165- | Epson FX/MX/RX 70/80/85 | 2.50 |
| 187- | Epson FX/MX/RX 100/185/285 | 3.50 |
| 288- | Epson Lq 800/LX 800 H.D. | 3.50 |
| 289- | Epson Lq 1000 H.D. | 4.50 |
| 163- | Epson Lq 1500 | 2.95 |
| 281- | Epson Lq 2500 H.D. | 4.50 |
| 175- | Epson LX 80/90 | 2.50 |
| 226- | Facit 2300/4512/4514 | 2.95 |
| 133- | Facit 4500/4510/4511/4513 | 3.75 |
| 135- | Facit 4520/4525/4526/4528 | 2.60 |
| 991- | Fujitsu DMPG 8/DX 2100-2200 | 3.95 |
| 171- | General Electric 300/341/W/I | 35.00 |
| 146- | Hewlett Packard 2608 | 18.65 |
| 145- | Hewlett Packard 2631A | 10.95 |
| 223- | Honeywell 1500/7023/9104 G.P. | 2.50 |
| 181- | IBM 3287/3615 Silver Dot Cup/Loop 1.80 | |
| 195- | IBM 3287/3619 Silver Dot Cartridge 2.50 | |
| 162- | IBM 3288 1/2" Harmonica | 3.00 |
| 165- | IBM 3778 3/4" Harmonica | 3.00 |
| 168- | IBM 4201 ProPrinter | 3.75 |
| 176- | IBM 4202 ProPrinter XL | 4.50 |
| 196- | IBM 5224 Baseball Bat | 13.95 |
| 196A- | IBM 5224 Baseball Bat Shield | 6.00 |
| 178- | IDS Prism Black 132/2090/2132 | 3.50 |
| 178A- | IDS Prism Primary RD/BL/GR/B | 9.75 |
| 178B- | IDS Prism Process CY/MA/Y/BL | 9.75 |
| 286- | Mannesmann Tally 85 | 3.95 |

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|-------|---------------------------------|-------------|
| 285- | Mannesmann Tally 86 | 4.50 |
| 233- | Mannesmann Tally 1000/1200/1600 | 2.75 |
| 204- | Mannesmann Tally 100/120/160 | 3.00 |
| 205- | Mannesmann Tally 130/140/180 | 3.50 |
| 200- | NEC 5500/7700 Nylon Cart | 2.45 |
| 114- | NEC 8023 PC/8024 PC/8027 PC | 2.95 |
| 660- | NEC Pinwriter P1/P2 | 3.60 |
| 651- | NEC Pinwriter P3/P7 | 3.95 |
| 662- | NEC Pinwriter P5 H.D. | 3.95 |
| 209- | Okidata 182/183/192/193 w/Inker | 3.95 |
| 206- | Okidata 292 | 4.85 |
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| 217- | Panasonic KXP 1080/1081/1093 | 6.90 |
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| | TRS80/LPI | 3.95 |
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| 263- | Star Micronics Radix 15/SR15 | 4.10 |
| 290- | Star Micronics SD10 | 3.75 |
| 291- | Star Micronics SD15 | 4.10 |
| 135- | Telex 287D/287D2 | 2.60 |
| 242- | Texas Instruments 850/855 | 3.10 |
| 243- | Texas Instruments 860/865 | 3.20 |
| 245- | Toshiba P321/P341/P351 | 3.10 |
| 245- | Toshiba P1340/P1350/P1351 | 3.10 |
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| 131D- | Univac 0789/0790 | 4.95 |

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(correctable / multi-strike)

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| 307- | Brother HR15/25/35 M/S | 3.75 |
| 227- | CPT Rotary 8/9 M/S | 2.95 |
| 158- | Diablo Hylite II M/S | 2.25 |
| 317- | Diablo Xerox Memorywriter | 3.50 |
| 348- | Epson DX 10/20/35 M/S | 4.40 |
| 168- | Facit 4560/8000 Corr. | 4.75 |
| 1960EM-IBM5218/5219 Displaywriter | | |
| | M/S OEM | 11.25 |
| 222- | IBM 6240 M/S | 1.75 |
| 6120EM-IBM Quietwriter N/C | | 10.95 |
| 740- | IBM Wheelwriter Corr. | 3.50 |
| 730- | IBM Wheelprinter M/S | 7.90 |
| 320- | IBM Selectric II H.Y. Corr. | 1.55 |
| 202QEM-NEC 2000/3500/8800 Flip M/S | | 11.80 |
| 201- | NEC 5500/7700 Spinwriter M/S | 2.50 |

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| 303- | Nakajima Corr. | 3.50 |
| 304- | Nakajima M/S | 5.50 |
| 334- | Olivetti ET 201/121 Corr. | 3.00 |
| 334B- | Olivetti ET 121/351 M/S | 4.40 |
| 222- | Qume I/Spin 3/5 M/S | 1.75 |
| 223A- | Qume III Quick Load | 2.40 |
| 219- | Qume IV Spin 7.8, 10, 11, 12 M/S | 2.95 |
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| 445- | Burroughs 9245/9247 5M | 15.95 |
| 453- | CDC 100/200/300 | 4.75 |
| 450- | Centronics 100/300/500 | 3.75 |
| 453- | Data 100/300/400 | 4.75 |
| 454- | Decision Data 6807/6811/6814 | 6.95 |
| 455- | Dec writer LA 30/36 | 2.50 |
| 456- | Dec writer LA 120/180 | 3.50 |
| 480- | Facit 4540/4542 Black | 3.70 |
| 462- | IBM 3262/5262 | 4.95 |
| 465- | IBM 3525 T/5 | 3.00 |
| 463- | IBM 5211 | 3.75 |
| 464- | IBM 5225/5250/5260 | 14.50 |
| 470- | Okidata 80, 82, 92, 93 | 1.25 |
| 471- | Okidata 84.94 | 2.50 |
| 467- | Printronix 150/300/600 | 4.95 |
| 955A- | Seiko Universal Black/Red | 1.25 |
| 470- | Star Micronics Gemini 10/10X | 1.25 |
| 455- | Texas Instruments 800/810/815 | 2.50 |
| 456- | Texas Instruments Omni 820 | 3.50 |
| 401- | Wang 2221/5521 | 2.75 |

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- INCLUDES SERIAL PORT AND PARALLEL PORT

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- 1 WAIT STATE
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- SOCKET FOR 1 MB OF RAM AND 80257
- BATTERY BACKED CLOCK

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- 80286 6/8 MHz
- HARDWARE SELECTION OF 5 OR 8 MHz
- 1 WAIT STATE
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- SOCKET FOR 1 MB OF RAM AND 80257
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CIRCLE 526 ON READER SERVICE CARD

HOW TO SUCCESSFULLY BUY THROUGH MAIL ORDER AND PROTECT YOUR RIGHTS

Mail order sales are governed by rules of the Federal Trade Commission (FTC) and various state laws. These guidelines are published as a service to you. Remember, the many vendors advertising in PC Magazine are eager to serve your needs.

FTC rules say:

1. The Seller must ship your order within 30 days of receiving it, unless the advertisement clearly states it'll take longer.
2. If it appears that your order will not be shipped when promised, the Seller must notify you in writing in advance of the promised date, giving a definite new date, if known, and offering you the opportunity to cancel the order with a refund or consent to a definite delayed shipping date or an indefinite delay.
3. The Seller's notice must contain a stamped self-addressed card or envelope with which you can indicate your preference. If you don't respond to this notice, the Seller may assume you agree to the delay, but must either ship or cancel your order within 30 days after the original

shipping date promised or required. A prompt refund must be made when an order is cancelled.

4. Even if you've consented to an indefinite delay, you retain the right to cancel the order at any time before the item has been shipped.
5. If you choose to cancel an order, that has been paid for by check or money order, the Seller must mail you a refund within seven business days. If you cancel an order for which you paid by credit card, the seller must credit your account within one billing cycle following receipt of your request. Store credits or vouchers in place of a refund are not acceptable.
6. In the event that the item you ordered is unavailable, the Seller may not send you substitute merchandise without your express consent.

TIPS WHEN ORDERING

When ordering by mail:

State precisely what merchandise you want, specifying details such as model, make, size, component parts, etc.;

Confirm the price and expected delivery date as stated in the ad;

Indicate whether you will accept a substitute product if the item you ordered is unavailable, and, if not, that your payment should be returned;

Don't send cash, you will have no record of payment if a problem arises, and;

Keep a copy of your order and all other correspondence with the Seller. Your records should include the company's name, address and phone number; a description of the item ordered; your cancelled check or a copy of the money order; record of the date you mailed the order; and any sales slips and shipping receipts.

When ordering by phone:

Note the time and date of your conversation and the name of the person you talk with;

Make a record of your order, the price, its promised availability and the components to be expected;

Save all correspondence associated with your order, including your cancelled check or a copy of the money order, and any written confirmation sent by the Seller.

Questions you should consider asking:

Does the advertised item come with all necessary parts and accessories? Are they from the same manufacturer?

Is it available for immediate shipping? If not, when will

it be available?

Has there been an increase in the advertised price?

What warranties does the item carry? Who provides the service?

What is the Seller's return policy?

What is the Seller's refund policy?

With whom should you correspond if there is a problem?

IF YOU HAVE PROBLEMS:

1. If you have not received your order as promised or if the item is defective, immediately notify the Seller in writing referring to your order by description, price, date, as well as by account number and order number, if available. Make sure you keep a copy of the letter.
2. If you complain by telephone, send a follow-up letter to confirm what was said.
3. If you think the merchandise is defective, reread your product instructions and your warranty carefully to be sure you don't expect features or performance the product isn't designed to give. Then contact the Seller for instructions. Don't return it to the Seller until you have been instructed to do so.
4. When returning merchandise make sure you keep the shipper's receipt or packing slip; your right to be reimbursed for postal cost is determined by store policy.
5. If you have completely discussed your problem with the Seller and are still not satisfied, write to the consumer complaint agency in the Seller's state. If you paid for the merchandise by credit card, you may have rights to withhold payment under a Federal law called the Fair Credit Billing Act.



Marketplace

The PC Buyers Guide to Products and Services

This is your showcase—your direct source of information on PC products and services. PC Magazine Marketplace gives you quick access to exactly what you're looking for, plus information regarding price, discounts, specifications and delivery. Use this guide to help you decide which products to buy.



Is your media plan taking a nap just when the buyers are waking up?



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Remember Commands Easily

If, like many people, you use several software packages in your job, you could have more than 1,000 commands to remember. With a PC-DocuRef on your keyboard, you have an easy-to-use memory aid right at your fingertips.

Save Time and End Frustration

You'll save hours of time because you won't have to dig through cumbersome manuals for commands. PC-DocuRefs are functionally organized and fully color-coded to help you find commands fast.

Learn New Commands and Functions Quickly

A PC-DocuRef quick reference guide can help you learn and use PC software faster and with more confidence. You'll master new software more easily while you discover powerful, untapped features in familiar programs.

Fits any Keyboard

PC-DocuRef attaches to any keyboard, including portables and laptops, using velcro-like fasteners. It's easy to put on and easy to switch to another PC-DocuRef when you change programs.

Unique Design for Ease of Use

The unique PC-DocuRef design makes it the perfect software companion.



Here's why PC-DocuRef is the best software quick reference.



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HIGH-END GRAPHICS SOFTWARE

The newest business graphics programs are making *Lotus 1-2-3*—manufactured charts a relic of the two-dimensional past. Contributing editor Jim Seymour leads off this feature with the strides that graphics programs have made in the last year and offers tips on how to keep the clutter out of your charts and graphs. Look for our review team's assessment of the top-ten programs around: *Boeing Graph*, *Chart-Master*, *EnerGraphics*, *Freelance Plus*, *GEM Graph*, *Graphics Gallery*, *Harvard Graphics*, *Lotus Graphwriter II*, *Microsoft Chart*, and *Windows Graph*.

PS/2 ADD-IN MEMORY BOARDS

Because IBM's PS/2 Models 50 and 60 lack sufficient native memory to run OS/2, add-in memory boards are needed to accommodate the new operating system. Contributing editor Winn L. Rosch examines the first design efforts from AST, Cumulus, IBM, IDEAssociates, Quadram, STB, and Tecmar.

INTEGRATED WP PACKAGES

PC Magazine's second installment of our massive word processing roundup focuses on 18 feature-packed integrated packages. Our reviews, features table, and performance tests help you separate the exemplary from the merely satisfactory.

THREE NEW 386s Mitsubishi, Wyse, and Zenith have taken the high road into the 386 market—with price tags to match. Winn L. Rosch evaluates these new, speedy travelers.

LCD OVERHEAD SYSTEMS Before LCD you could convert presentation graphics images into a number of physical formats, except direct animation. LCD overhead systems allow you to skip the plotter/film recorder process but are often costly and cumbersome to transport. Frank Bican reviews ten overhead displays from Apollo Audio Visual, Computer Accessories, Eastman Kodak, Eiki International, nVIEW, Sharp Electronics, Telex Communications, and Vivid Systems to help you decide if the pros are worth the cons.

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Valid after May 31, 1988

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2. Your primary job function is (check one):

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n. ☐ 100 or more

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p. ☐ Linked to mini
q. ☐ Networked together

6. Does your company own

- r. ☐ Mainframe(s)
s. ☐ Mini(s)

7. Do you plan to buy

- t. ☐ Now
u. ☐ In 4 to 6 months
v. ☐ In 6 to 12 months
w. ☐ No definite plans

8. Number of employees in your entire company?

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2. ☐ 1000 or more

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AFTER HOURS

TurboTax

(continued)

much like actual IRS forms. Once you have given the program some basic personal information, a touch of the Slash key conjures up the main menu in a small window. Press F (for Forms), and a list of 24 forms and schedules fills the window. Put the cursor on the form of your choice, press Return, and the form appears on-screen. Instantaneously.

You can either go directly to a supporting form and fill in the details that next will be carried to the proper place on Form 1040 (which summarizes all the supporting details) or you can start with the 1040 and compile

window—also on the main menu—to create a supporting schedule or itemization for the entry, which you can print out later.

All of these window features do their work while letting you keep an eye on the line of the form where your digression started. You don't need a trail of cracker crumbs to remind you where you were.

The program can be set to recalculate the entire tax return after each entry and, even when tested on an antique 1982 IBM PC propped up with a Plus HardCard, the lag was a barely noticeable fraction of a second. True to its name, the operation of ChipSoft's *TurboTax* is fast, logical, and simple. It lets you

TurboTax feature is the Quick Link Forms Finder, a list of over 500 tax terms together with the schedules and forms to which the terms relate. Also new is the Data Examiner. When you think you're done with your return, the Data Examiner will check the fruits of your labor and remind you if you have left out some common requirement, such as filling in all the mandatory blocks.

The IRS has always accepted most legible printouts of all forms and schedules except Form 1040 itself. The sacrosanct 1040 information had to be submitted on Uncle Sam's own pale-blue-and-white form unless the IRS had bestowed its blessing on a facsimile. Until now, only laser printouts of 1040s from expensive drivers were allowed. This year, the *TurboTax* dot matrix 1040 has won IRS acceptance.

If you like the authenticity of sinking your teeth into the actual IRS forms and schedules, you'll love the *TurboTax* approach. And if you are confused by some of the more arcane reaches of the forms, the extensive on-line help screens and other useful features will ease your frustration.

Once you have polished off your 1987 return, you may want to run the *TurboTax* 1988 tax planner included in the program to see how next year's tax rule changes will affect your present income. Then try the inflation factor to see how much more you'll need to make to stay even.

The operation of the program is so simple and intuitive that the experienced power user might forgo consulting the manual altogether. But if you're not on a daily diet of learning new programs and would prefer to rely on clear instructions rather than on your own hit-or-miss fumbling, the 200-page manual covers each of the program's features and operations. For each official form or schedule and for several of *TurboTax*'s own worksheets, the manual of-

fers an illustration of the screen accompanied by pithy directions. The manual also has more explanations of tax concepts than I have seen in most other programs. Wisely, the manual still disclaims responsibility for giving advice on taxes and advises you to consult a specialist regarding answers to the tough questions.

For the modest \$75 list price, *TurboTax* does an excellent job on the federal individual income tax return. A state module runs another \$40. There is also a professional version of *TurboTax* that retails for \$295. It includes more forms, data sheets, and client letters. Also, a laser printer driver (available for another \$200) is reputed to draw beautiful tax forms.

In addition, *TurboTax* gives you a paperback copy of *The Price Waterhouse Personal Tax Advisor*, 1987/88 Edition. A witty, 262-page compendium of tax-saving tips, this book covers such topics as the new rules on deductions for travel and entertainment, and the potentially expensive new tax laws for the unearned income of children under the age of 14. Reading this helpful book is the next best thing to talking your situation over with a tax specialist.

If you are in one of those areas of the country where the IRS is running its pilot program of electronic filing, keep an eye on *TurboTax*. Its publishers are working to be sure that the program is compatible with the electronic filing standards as soon as they become available.

This year only professional tax preparers are eligible to use them. Ah, but next year!

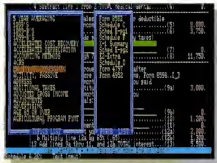
List Price: TurboTax, \$75.

Requires: 256K RAM, two disk drives, DOS 2.0 or later. Not copy protected. ChipSoft Inc., 5045 Shoreham Pl., #100, San Diego, CA 92122; (619) 453-8722.

CIRCLE 639 ON READER SERVICE CARD

Laura Lou Meadows is a practicing tax lawyer in New York City.

TurboTax has a new feature that finds the forms relating to a specific topic.



a supporting schedule as you come to each line that requires one. Either way, with a single keystroke you can toggle back and forth from a line on Form 1040 to its particular backup schedule, and vice versa.

If you need a quick bout of arithmetic before filling in an entry, you have two choices. A calculator window can be summoned from the main menu, which will total up a batch of numbers (say, all those business lunches you plan to deduct) and will put the result on the line where you were when you opened the window. Or if you want to keep a backup record of, for instance, the tally of your lunch tabs, use the expansion

breeze through the computer procedures so that you are free to focus your fear and loathing on the complexities of the tax rules themselves.

To deal with the tax rules, one of the most inspired embellishments for the current version is the on-line IRS instructions, which can be summoned from the main menu with two keystrokes. This is where the instructions should have been all along, available in windows on top of the appropriate form to which the instructions pertain. I was told that ChipSoft has five tax specialists working year-round to put the new rules into the program. It shows.

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AFTER HOURS

The Tax Advantage

(continued)

you are using a dot matrix printer and gives you a choice of draft or final printouts. The supporting schedules are fit to be filed, but the manual suggests that you copy the figures onto the Form 1040 by hand since the IRS doesn't accept the program's printed version.

List Price: *The Tax Advantage*, \$59.95.

Requires: 256K RAM, two disk drives, DOS 2.0 or later. Not copy protected. Double Eagle Software Inc., 2210 Wilshire Blvd., #875, Santa Monica, CA 90403; (213) 459-9748.

CIRCLE 640 ON READER SERVICE CARD

Tax Preparer. A slow operator in its early years, the program has been brought up to speed now that all of its calculations are written in assembly code. Give it more memory and a hard disk, and it whizzes along with the best of them.

As good tax software should, *Tax Preparer* operates on the fundamental premise that first you enter each piece of information only once, and then the program takes care of putting it in all the appropriate places. If you need a supporting or explanatory schedule for a line of Form 1040, the program will often create that for you automatically, usually behind the scenes. The additional forms and schedules are appar-

ish out as need dictates. Only a keystroke away is an explanation—running across the bottom of the screen—of how to use the function keys.

To deal with changes to numeric entries, *Tax Preparer* has a simple on-screen calculator. Put the cursor on the number where you need to include a few more items, type the Plus sign, the number to be added, and press Return. The addition for the line is done in place, on the line. The calculation utility works just as fast using the Asterisk key for multiplication and the Slash key for division.

If the program's extensive automation brings results you don't like, the Override function allows you to substitute your own numbers for those the program has calculated. Once you use Override, however, you may have compromised the accuracy of the final tax computation, so the manual wisely counsels restraint and caution when using this feature.

Tax Preparer doesn't display full forms on the screen, but typically uses a split screen—displaying a menu on the left and a condensed segment from a tax form or schedule on the right (keyed to the same line numbers on the IRS form). This arrangement presents a lot of information; however, it also makes the screen seem a little cluttered.

The thorough manual, fol-

ished over the years, has a pleasantly avuncular tone. Using illustrations of all the crucial screens, it explains the many features of the program in clear detail and takes you through the basics of the tax rules you are trying to grapple with.

The program, priced at \$295, contains all the elements both for individuals doing their own returns and professional tax preparers who do returns in quantity. The professional portion includes data organizer sheets, batch processing, and client letters. A state tax module is available for California only.

List Price: *Tax Preparer*, \$295.

Requires: 128K RAM, two disk drives, BASICA file from DOS 2.0 or later. Not copy protected. HowardSoft, 1224 Prospect St., #150, La Jolla, CA 92037; (619) 454-0121.

CIRCLE 641 ON READER SERVICE CARD

The screenshot shows a menu on the left with options like '1. RETURN', '2. SCHEDULE A', '3. SCHEDULE B', etc. The right side shows a portion of a tax form with fields for 'GROSS INCOME', 'ADDITIONAL INCOME', 'DEDUCTIONS', etc., with values entered or calculated.

The Tax Advantage reminds you when you have itemized a line

Tax Preparer

Like an old friend you can turn to year after year, HowardSoft's *Tax Preparer* is the dependable resource that you can always rely on. Almost a decade old in microcomputer history (it must be at least 200 in elephant years), *Tax Preparer* smoothly and efficiently works through all the intricacies of your taxes for you.

Tax Preparer is unique in putting a fully integrated federal income tax return program on a single disk; it is capable of running on PCs with as little as 128K RAM. However, you must use the BASICA file from your own copy of DOS to run

ent only when you ask for a printout of your full return.

Tax Preparer has 24 of the most commonly needed forms and schedules built in, along with the capacity to create and print itemized listings to support any specific entry for which you wish to preserve backup data. Just put the cursor at the line where you need it and type F10, and the proper IRS supporting schedule will appear on-screen if it is among those included in the program. If the supporting schedule isn't in the program, the Itemize function will bring up either a preformatted worksheet tailored to that line, or a sheet of blank lines for you to

TurboTax

Having started out on a fast track, *TurboTax* gets better each year. For 1987, this classy individual income tax return program takes on the job not only of integrating the far-reaching tax law changes passed in late 1986, but also of tackling the even more cumbersome task of explaining a fair number of the rules along the way.

As in years past, *TurboTax* uses screens that look very

(continues)

The screenshot shows a menu on the left with options like '1. RETURN', '2. SCHEDULE A', '3. SCHEDULE B', etc. The right side shows a portion of a tax form with fields for 'GROSS INCOME', 'ADDITIONAL INCOME', 'DEDUCTIONS', etc., with values entered or calculated.

The left side of the *Tax Preparer* screen shows the menu path taken to get to your position in the form on the right

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One of the things they discovered was that "the number one form of marketing support dealers expect to facilitate sales is advertising directed at buyers." And what is their preferred book? "Our dealers not only clamor for advertising to pull customers through the door, they insist it be in PC Magazine—by a very wide margin!"

Canterbury International is a firm believer in intensive advertising. "That's how you make dealers comfortable about stocking your product. They need to recognize it, they need to know it's being supported and that it's going to be around. It's just as important for us to build brand loyalty with dealers as it is with buyers. We get both in PC Magazine.

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Barbara M. Baird

Barbara Baird
Canterbury International

Remember, PC Magazine delivers 500,000 brand specifiers who consider PC Magazine an indispensable part of their brand selection. Canterbury International couldn't agree more.

Without question, PC Magazine is the preeminent PC/MS-DOS publication. Not only because it offers marketers the fastest growing and largest circulation in the field, but it is also the one publication brand specifiers read most and trust most. It's here that you can find your best sales and build brand awareness for the future.

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AFTER HOURS

PC/TaxCut

(continued)

This year *PC/TaxCut* gives you a lot more for your money. The preliminary review version I tested came on six floppy disks that total over 2MB. If it hadn't been for my hardcard, I would have been shuffling more disks than a Las Vegas croupier. On a more positive note, Best Programs has reduced the price of *PC/TaxCut* from \$195 to a very competitive \$75. State modules are not available for this program.

If you are planning to do more than just your own plus your Uncle Howie's federal return, Best sells a professional tax program for \$995, including state tax modules, additional forms, a laser printer driver, and electronic filing capability.

List Price: *PC/TaxCut*, \$75.

Requires: 312K RAM, two disk drives, DOS 2.0 or later. Not copy protected. Best Programs, 2700 S. Quincey St., Arlington, VA 22206; (703) 820-9300.

CIRCLE 642 ON READER SERVICE CARD

The Tax Advantage

Six years ago when Double Eagle Software began producing *The Tax Advantage* for a wide range of microcomputers (it sells versions for Apple, Atari, and Commodore as well as IBM), it probably had a significant edge over the sparse competition. *The Tax Advantage* Early Bird edition for 1987 tax returns, which I tested, remains a competent program—but it is outclassed by other packages having greater speed and more sophisticated features.

The Tax Advantage's author, Henry Hilton, says his program is aimed at the person who wants to be spared the agony of plowing through the densely packed print on IRS forms and who would prefer to work with only six to ten lines at a time. Further, it's designed for the taxpayer who doesn't need a lot of exotic forms.

The first thing to do is check

to see if the forms you need are included in the short lineup of basics that this program can handle. Starting with the essential Form 1040, it will give you the forms for employee expenses, 2106; child care, 2441; depreciation, 4562; and the alternative minimum tax, 6251. It also contains schedules A, B, C, D, E, F, and SE dealing with itemized deductions, interest and dividend income, self-employed income, capital gains and losses, supplemental income (such as rents or royalties), farming income, and Social Security tax on self-employed income, respectively. These forms and schedules will cover the tax-filing needs of a lot of people. If you are among them and you don't need a lot of advice about what gets included and what goes where, you're in clover.

In its favor, *The Tax Advantage* has a demo feature that will lead you through the program, highlighting the commands for entering data on Form 1040 along with the supporting forms and schedules. Then it either compiles the supporting schedule/form if it is included in the program, or opens a separate file to itemize the entry. This allows you to enter amounts you've figured manually on a form not supported by the program, such as the new Form 8615 for income of children under 14.

The Tax Advantage lets you skip over the lines you don't need so that you can go directly to the 1040 line you do need, provided that you happen to know the number of the line. As you enter each item in a form or schedule, the program automatically recalculates the total tax. And you can check the amount of your tax liability and your income bracket at any time for the items you've entered by invoking a window at the bottom of the screen. Finally, the program will integrate into Form 1040 the results of all the forms and schedules you've used.

On the downside, I found the



Finding the Forms and Schedules You Need

| Tax preparation package | Forms | Schedules |
|--------------------------|--|-------------------------|
| <i>PC/TaxCut</i> | 1040, 2106, 2119, 2210, 2441, 3468, 3800, 3903, 4562, 4797, 4952, 5695, 6251, 8582, 8598, 8615 | A, B, C, D, E, F, SE |
| <i>The Tax Advantage</i> | 1040, 2106, 2441, 4562, 6251 | A, B, C, D, E, F, SE |
| <i>Tax Preparer</i> | 1040, 1040ES, 2106, 2119, 2210, 2441, 3468, 3800, 3903, 4562, 4797, 6251, 6252, 8582, 8598, 8615 | A, B, C, D, E, F, R, SE |
| <i>TurboTax</i> | 1040, 1040ES, 2106, 2119, 2210, 2441, 3800, 3903, 4255, 4562, 4684, 4797, 4952, 4972, 6251, 6252, 8582, 8598, 8606, 8615 | A, B, C, D, E, F, R, SE |

program relatively slow, marred by long pauses while loading programs or data each time it switched from one form or schedule to another. Also, when you make a change in a supporting schedule, you must update your calculations to have this change reflected in Form 1040. This is a cumbersome combination too easily overlooked if you have been wrestling with the underlying schedule more than once. It also takes a while to appreciate the convention that the program does not accept an entry typed in lowercase letters, but will if it is in solid caps.

A major reservation I have

about *The Tax Advantage* is that it has very few built-in limitations on what amounts can be entered for any given item, even though there may be a formula in the tax rules. The author's philosophy is that the lack of restriction gives the taxpayer freedom to call his own shots and fill in whatever he wants. What I want is a program that will warn me of a pitfall before I do a pratfall with IRS auditors. Since the manual contains almost no substantive tax guidance, the user needs to know—or seek elsewhere for—enough information to avoid errors.

The Tax Advantage assumes

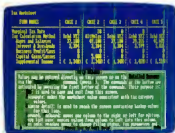
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On the other hand, if you seek software that can stand up to a small business, then the speed, unlimited account capability and automatic double-entry accounting will give you a sense of power.

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TAX SOFTWARE

Getting a Jump on April 15: Four Tax Preparation Programs

Before you know it, April 15 will be here—the dreaded deadline by which you must file your federal income tax return. Tax preparation software automates the tedious process of filling out the forms and can alleviate the high anxiety you may face when dealing with Uncle Sam.

To help you decide which, if any, tax preparation package meets your needs, in this issue and the next *After Hours* will review to personal income tax preparation packages.

In this issue, Laura Lou Meadows reviews *PC/TaxCut*, *The Tax Advantage*, *Tax Preparer*, and *TurboTax*. These four packages have been on the market for a while; previously they have been looked at in *PC Magazine's* annual tax preparation software reviews. —Catherine D. Miller

BY LAURA LOU MEADOWS

PC/TaxCut

Now in its fifth year, *PC/TaxCut* is a well-bred tax return preparation package. So sure of its bloodlines, *PC/TaxCut* guarantees, "If the IRS makes you pay a penalty because of a mathematical miscalculation in

PC/TaxCut, we'll pay it."

PC/TaxCut's bravura promise means it will do the arithmetic and type up your tax return correctly—as long as you have made all the proper initial decisions about what numbers go in which blanks. Considering all the limitations, formulas, and cross-references that are involved in preparing many tax returns—now stepped up under the recent federal tax law changes—neither job is a small undertaking.

PC/TaxCut's approach is, keep it simple. Beginning with ten briefly described main menu choices that represent segments of the tax return itself and continuing down to the nether regions of sub-subcalculations, such as investment interest limitations, the program always presents a clean and comprehensible screen. Tax techies will recognize an occasional snippet of IRS terminology, but the main thrust of *PC/TaxCut* is to demystify taxes by posing just a few questions at a time—expressed in straightforward terms

(where the IRS lets you be straightforward, that is).

When backup schedules and forms are needed, the program will move to them automatically—if they are among the 24 most commonly used forms that the program includes. Unless you use the display feature to view your completed tax return before you print it out, you may finish calculating your taxes without being aware of which forms the program has used for your return.

Often it is the tax rules themselves that aren't terribly straightforward. For example, *PC/TaxCut's* screen for Schedule A interest deductions refers to "deductible points." The program is merely following the IRS Schedule A, which contains a line for deductible points. However, figuring out whether the points you paid to the Encumbrance Savings & Loan are deductible points or nondeductible points is not so

the Question Mark key. When it's good, it is brief and astute. At other times, it may be only a simplistic restatement of the item itself.

PC/TaxCut's reassuring manual contains simplified explanations of tax and accounting concepts, as well as the computer procedures for inputting all your tax data into the program and then printing it out. When a return requires a form that is not included in the program, the manual will often identify the form you need. After telling you to get the form and fill it out by hand, the manual shows you where to enter the result in the program.

When it is time to print out your return, the program produces all the schedules and forms in a format that is acceptable for filing with the IRS. In previous years the IRS has required you to use its own Form 1040, unless you had a laser printer and a special driver to

PC/TaxCut's help feature pops up a window about the line your cursor is on.



AFTER HOURS INDEX

PC/TaxCut

Aims to demystify the tax rules

The Tax Advantage

Shields you from the complexities of Form 1040

Tax Preparer

This decade-old package offers more forms in less space

TurboTax

A classy tax preparation package

simple; this is where the disclaimers in the manual about the program's not giving tax advice kick in.

To explore certain questions, *PC/TaxCut* has a nifty new on-line tax explanation feature that you call up by pressing

create a facsimile. This year the IRS has approved a dot matrix version of Form 1040 for filing. *PC/TaxCut* can print an acceptable dot matrix version of Form 1040 if used with an Epson or IBM dot matrix printer.

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Work like this doesn't just happen.

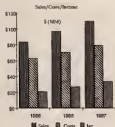
LKXS RADIOGRAPHY OPERATING GROUP

Review of Operations

During 1987, the LKXS radiography companies pressed forward vigorously with a series of product introductions and marketing programs designed to transform LKXS into a "new business" geared for sustained growth in both the increasingly competitive U.S. biotechnology field and the emerging biotechnology market worldwide.

Profits Up in Growth Year

Throughout 1987, employees worked diligently to improve current product quality, control operating costs, and provide outstanding customer service. As a result, LKXS recorded its best profit year ever despite substantial expenditures to develop and introduce the Model NR².



To foster continued growth in overseas markets, we opened subsidiaries in Japan and Hong Kong.

These commitments have already paid off with international sales accounting for 7% of total revenues. Next year, we expect a strong showing as these subsidiaries continue to establish themselves.

1987 Revenues by Area

(Dollars in millions)

| REGION | AMOUNT | PERCENT |
|--------------|---------------|-------------|
| Northwest | \$ 9433 | 35% |
| Midwest | \$ 2885 | 29% |
| New York | \$ 1094 | 11% |
| New England | \$ 1068 | 11% |
| Southwest | \$ 713 | 7% |
| Int'l | \$ 633 | 7% |
| TOTAL | \$9846 | 100% |

To make sure we stay closely in touch with our customers, in 1987 the LKXS companies expanded their customer service areas by 20%, spending \$25 million to train their account management personnel.

Model NR² is a Success

The introduction of the Model NR² is a good example of our success in pressing technology forward and communicating the benefits of this new technology to hospitals and research institutes around the world.

LKXS representatives introduced the Model NR² at major conferences in the field, both in the United States and overseas, to an

If it's not one thing, it's another.



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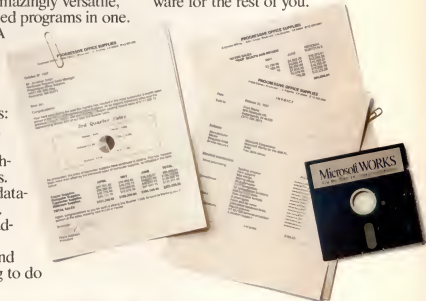
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